



FOODCORPS LESSONS BOOK 2019–20



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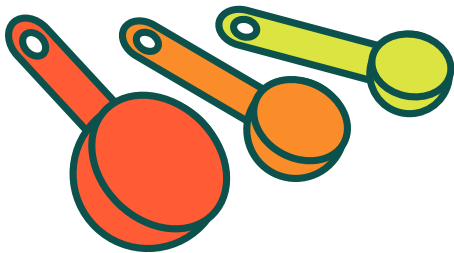
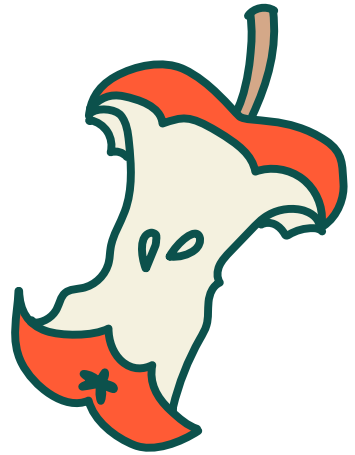
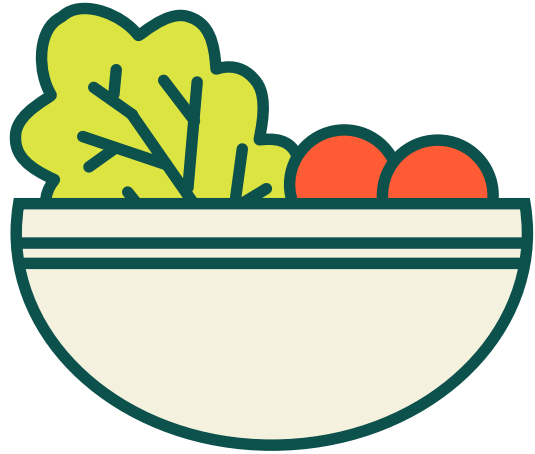
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Acknowledgements

The FoodCorps community, including service members, alumni, staff, partners, and resource experts, has made this resource possible. We truly appreciate the input, guidance, and feedback from our network, which ensures we provide high quality, relevant resources for connecting kids to healthy food in school. We would like to thank the following contributors: Whitney Cohen from Life Lab; Pam Koch from the Laurie M. Tisch Center for Food, Education & Policy at Teachers College, Columbia University; FoodCorps alumna and lead FoodCorps Lessons writer Sarah Nealon; Rachel Willis from Elevating Equity; and the FoodCorps Programs team for their support.

We also want to express deep gratitude to all our funding partners for supporting our mission, supporting hands-on education, and helping us create these teaching materials. We want to give special thanks to Target and the Pisces Foundation for supporting the development of the FoodCorps Lessons.



Teaching Hands-On Lessons

As outlined in the *Service Member Handbook*, every FoodCorps service member is required to teach or co-teach ten or more hours of ongoing, high-quality, hands-on lessons to a minimum of eighty students. Each service member will develop a Service Member Plan that outlines how he or she will reach this goal. We have developed FoodCorps lessons for service members to use with their ongoing classes to meet the hands-on lessons requirement. Lessons are organized by grade level, theme, and season (fall, winter, spring). Although service members are not required to use FoodCorps lessons (some of our sites and schools already have curriculum they prefer to use), we encourage you to reference these lessons often, and use them when possible.

You will find all the FoodCorps lessons in this book and online on the FoodCorps Toolshed. The following pages also include an overview of the FoodCorps lessons learning progression and themes, along with charts to help you identify lessons based on grade, theme, season, and topic. Please also reference the *Sprout Scouts Handbook* on the Toolshed for garden-based activities and ideas for running a comprehensive after-school club with students.



FoodCorps Lesson Structure

After you review the FoodCorps Lessons Book, you'll notice that each FoodCorps lesson is structured the same way. Please review the framework below that shows what to keep in mind as you choose, adapt, or develop the lessons you lead with students.

Grade and Season: Lessons are designed for grades K–5 to be taught during fall, winter, or spring; however, many lessons can be adapted for any season.

FoodCorps Theme: Lessons are tied to one of FoodCorps' six themes. Themes are either knowledge- and concept-focused or skill-building focused. (See the FoodCorps Lesson Themes on p. 19 of this book)

Essential Question: A thought provoking open-ended question. This “big idea” provides the grounding framework for the lesson (see more below).

Learning Objective: This gives an overview of the lesson, including concepts and skills the students will learn.

Lesson Time: Each step in the lesson has an estimated time. The total time is listed at the top.

Materials: This is a list of materials needed to lead the lesson, including any cooking ingredients.

Preparation: This includes all steps required to prepare for the lesson. It is important to review early because some preparation may need to happen several days prior to leading the lesson.

Action Steps: This section follows the “5 Es” structure: Engage, Explore, Explain, Elaborate, and Evaluate. It includes a breakdown of time needed for each step.

Reflection: These are questions to discuss with your students to promote reflection. They include process and content questions. Reflection is included in the total time for the lesson.

Adaptations: These are ideas for adapting the lesson to take place outdoors or during a longer class period. Note that adaptations may require additional materials not previously listed in the lesson.

Academic Connections: If there is a connection to a Common Core State Standard or Next Generation Science Standard, it will be listed here.

You will also notice that many lessons have some portion written in italics. The words in italics are ideas for what you might say to your students when you lead the activity. This is not a script to which you must adhere; instead, it's a means of letting you know how a lesson could play out. Say things in your own words, and make these lessons your own!

Essential Questions

All FoodCorps lessons are linked to an “essential question.” Essential questions are a central part of the Understanding by Design curriculum planning process that authors Jay McTighe and Grant Wiggins championed. This approach to education focuses on identifying big ideas we want students to understand,

then building lessons that help students move toward greater understanding over time. Essential questions are open-ended; that is, they typically will not have a single, final, correct answer, and students can examine them at increasing depth over multiple years of schooling. According to McTighe and Wiggins, an effective essential question does the following:

- Is thought-provoking and intellectually engaging, often sparking discussion and debate
- Calls for higher-order thinking, such as analysis, inference, evaluation, or prediction; cannot be effectively answered by recall alone
- Points toward important, transferable ideas within (and sometimes across) disciplines
- Raises additional questions and sparks further inquiry
- Requires support and justification, not just an answer
- Recurs over time; that is, the question can and should be revisited again and again

With the FoodCorps lessons, you can use the essential questions to provide a grounding framework to guide student learning toward an understanding of key concepts about food and nutrition. Each lesson is designed to support students in exploring and discovering answers to the guiding essential question. Please consider how the essential question tied to each lesson provides a springboard for the rest of the lesson and how you might leverage this approach to your teaching; for example, by reinforcing key concepts and considering how other lessons you teach tie to these essential questions.

Recommended Resource

- *Understanding by Design Framework* of Jay McTighe and Grant Wiggins and the Association for Supervision and Curriculum Development (ASCD)

School Curriculum & Academic Connections

It is important to learn about the activities and content that teachers and school staff cover in the classroom and in before- and after-school programming. This will help inform how you can best integrate your FoodCorps goals of teaching food-, nutrition-, and garden-focused topics. Although there are national and state standards that drive curriculum (see more below), specific academic priorities and strategies are typically set at the state level and district level.

When working with classroom teachers, ask them to share their scope and sequence for the curricula they're using, and seek their input on how you might reinforce learning through the FoodCorps lessons. Many schools have curricula specialists. These are great people to have a meeting with to share more about your service and express your desire to help support student learning. Ask them for their advice on what areas you should consider exploring for lesson integration.

Learn about the instructional priorities of the schools you serve by asking questions:

- What academic standards does the school follow?
- What curricula are teachers required to use?
- How are students evaluated on their academic progress?
- Are there special programs that teachers are implementing?
- Are there any before- or after-school programs? What kinds of activities are involved?
- Are there any schoolwide initiatives to promote student learning, attendance, or positive behavior?

Your ability to gain access to class time, earn the trust of teachers and administrators, and deliver value to the school community will depend heavily on your ability to help schools and school leaders deliver on their own goals, while delivering on your own.

Common Core and Next Generation Science Standards

What are Academic Standards?

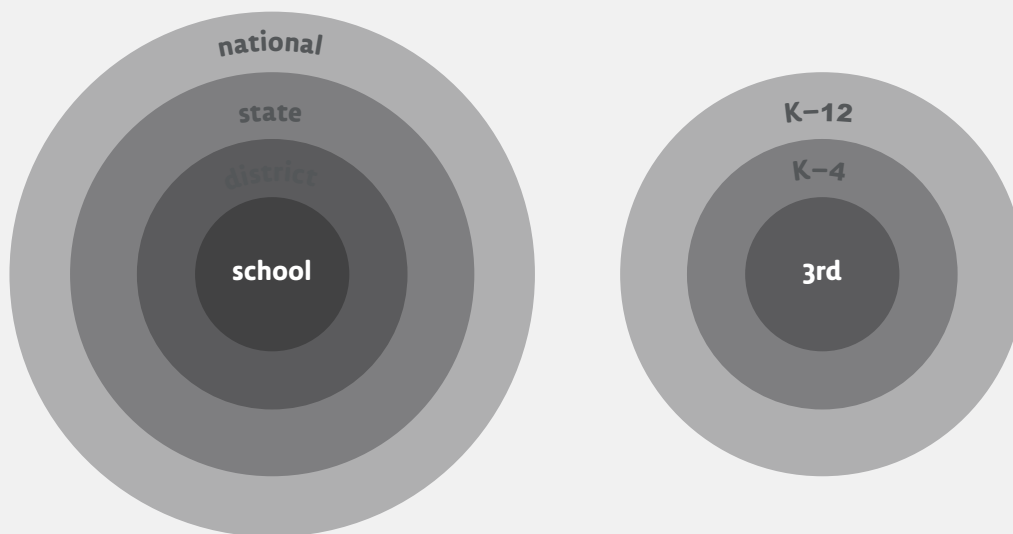
Every public school is guided by a curriculum framework or set of learning standards. Standards provide guidance about what students should know and be able to do by certain grades and are used to guide the work of teachers and administrators. Reviewing these standards is a good starting point for understanding how any hands-on learning you are leading through your FoodCorps service links to school curricula, which will help make the case for integrating lessons into broader classroom learning.

There are a few useful things to know about standards that will make it easier for you to navigate them. First, they come in layers. There are federal education laws that apply nationally, and there are state standards that guide the public schools in a particular state. Additionally, some school districts or charter networks, and even some individual schools, have their own curriculum frameworks. These are based on the state standards but often include a greater level of detail regarding grade-by-grade curriculum.

What are Common Core and Next Generation Science Standards?

You'll notice that each FoodCorps lesson includes "Academic Connections" to Common Core State Standards (CCSS) and Next Generation Science Standards (NGSS). The CCSS are English language arts and math standards that most, but not all, states have adopted. As of this printing, these standards, or some version of them, were adopted and being used in all FoodCorps states. Although some have criticized the CCSS for its focus on testing, the framework has been praised for bringing consistency and improved adoption of effective practices to our nation's fragmented

BE AWARE OF THE STANDARD THAT IS MOST RELEVANT TO YOUR TEACHING SITUATION.



Source: FoodCorps has adapted some of this section from the Shelburne Farms “Connecting Food, Farm and Nutrition Education to School Curricula” handout.

education system. The NGSS are K–12 science content standards that eighteen states have adopted. They emphasize ecological literacy and hands-on learning goals that closely align with FoodCorps’ approach. Still more states have adopted state science standards that are similar to the NGSS. Of the FoodCorps states, the following have adopted NGSS: Arkansas, California, Connecticut, Hawaii, Iowa, Michigan, New Jersey, and Oregon. All other FoodCorps states are using state-specific standards that you can learn about from your partner schools or find online.

FoodCorps Lessons and District or School Curriculum Framework

FoodCorps lessons highlight connections to the NGSS and CCSS, showing how each lesson addresses academic standards that are commonly in use in FoodCorps schools and giving you a helpful tool to explain to teachers and administrators how your service can support their objectives. However, as a service member, because you will be working solely within a given district or school, you should ask if these are the most relevant curriculum frameworks for your community.

Just as there are multiple layers of standards, those standards typically contain multiple layers that pertain

to different grade levels. There are often overarching Pre-K through grade 12 standards that apply to all students at all levels of schooling. These are then broken down into grade clusters, such as Pre K–4, 5–8, and 9–12, that identify how expectations change across elementary, middle, and high school levels. Within those grade clusters, some standards specify even more detailed expectations. For instance, if you’re working with a third grade class, check if there are standards specific to that grade. If you’re working with a broader range of grades, you might refer to the broader grade cluster standards.

Recommended Resources

- Common Core State Standards Initiative website
- EdWeb webinar: “Common Core in the Garden”
- Life Lab Connecting Garden-Based Learning with Academic Content Standards webpage
- National Farm to School Network webinar: “Food, Farm and Nutrition Curriculum Connections: Developing Educational Experiences That Meet Teacher Needs”
- Next Generation Science Standards website

The 5 Es: Engage, Explore, Explain, Elaborate, and Evaluate

When you look at a FoodCorps lesson, you will notice there are “Action Steps” that outline how you should lead the session. We developed each action step using the “5 Es” framework that Biological Science Curriculum Study developed. The 5 Es are a proven strategy for engaging students in fun, hands-on skill building. The 5 Es stand for Engage, Explore, Explain, Elaborate, and Evaluate. You can use the 5 Es to create your own lessons or strengthen other lessons you are delivering.

The purpose of each part is described below, along with tips for leading each part effectively.

Engage

Purpose—To help students connect with what they are learning about and stay focused

Methods for Engaging Students

- Establish the purpose of the day’s lesson.
- Activate students’ prior knowledge of the focus skill for the day.
- Get students excited to learn more about the lesson.
- Transition students from their typical school day into their FoodCorps lesson, which should feel different and special.

Tips for Engaging Students

- **Introduce the practice of gathering your students in the same routine at the beginning of every**

session, including an opening activity to activate brains and help calm bodies. Wait until everyone is quiet before you start talking. If students start talking while you are still talking, stop and wait until it’s quiet again.

- **Ask broad and open-ended questions to allow for critical thinking and equalize participation among your students.** Suggested questions are included in the action steps, or you can come up with your own. A broad question has many possible correct answers (similar to an essential question), such as the following: What are some things you think healthy food does for our bodies? In contrast, a narrow question has only one specific correct answer, such as the following: Which vitamins boost the immune system?
- **When facilitating group discussions, you may reference the tips in the Student Participation Structures section in the Program Guide.**

Explore

Purpose—To provide students with opportunities to explore physical materials or interesting ideas before they are fully explained; this practice inspires curiosity, engages critical thinking, and activates prior knowledge

Tips for Helping Students Explore

- **If you’ve sent students out to explore materials in the classroom or garden, you can use a callback to help grab their attention quickly when it’s time to**

move on to the next part of an activity. You can make an animal sound (such as crowing like a rooster or howling like a coyote) or use a chime or whistle. Introduce a callback when you meet students for the first time (see the “Developing Group Agreements” section in the Program Guide for more tips). Before you disperse in the classroom or send students out to the garden, establish a callback such as the following: *“When you hear me crow like a rooster, come on back! I’ll count down from ten, and we’ll see if everyone can get into a quiet circle before I get to zero.”* Right after you introduce the idea of a callback, have students practice. Ask them to wander around the classroom or garden and then gather quickly into a quiet circle when called back together.

Explain

Purpose—To teach students a new skill or explain a new concept

Tips for Explaining a New Skill

- **Whether they’re going to be preparing a bed, planting seeds, watering, or cooking, don’t just talk through the steps for a new skill—demonstrate the skill, with an emphasis on safety whenever relevant.** This will help all students, particularly English language learners, understand the instructions.
- **Wait until after you’ve demonstrated to distribute resources or tools and have students join in the work.**
- **Whenever possible, provide enough resources or tools for everyone to have their own.** This gives everyone a meaningful way to stay engaged. In cases where you do not have enough materials, think about student roles to help engage all learners.
- **Once they’re working, especially with new tools, broaden your focus to make sure that you’re watching everyone and ensuring their safety.**

Tips for Explaining a New Concept

- **Start by listening to students’ ideas about the new concept based on their recent explorations.** Build on their ideas, adding any new vocabulary or

concepts that they don’t mention.

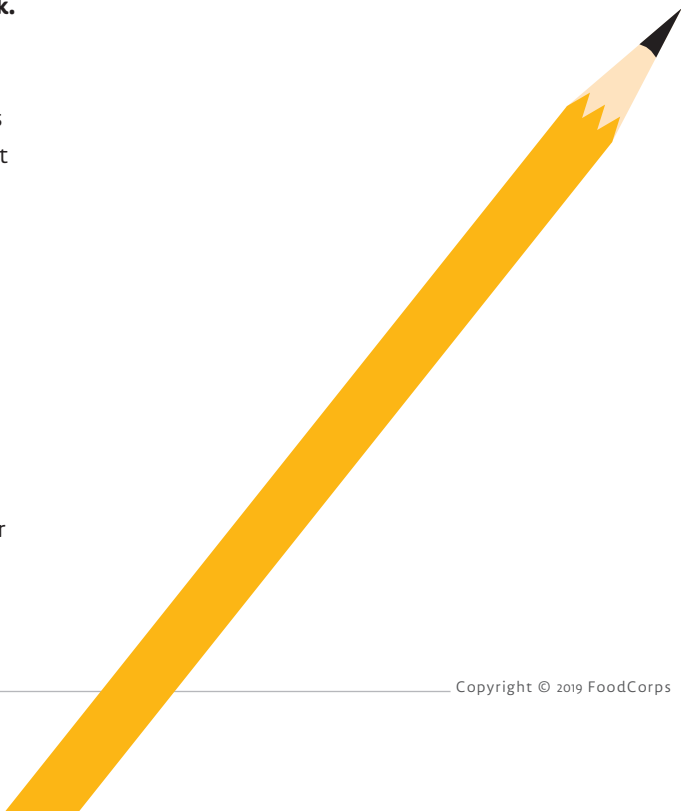
- **Use multiple modalities (see the Program Guide) to introduce new vocabulary or concepts.**

Elaborate and Evaluate

Purpose—To provide students with a chance to demonstrate their new skill and/or summarize what they’ve learned, which helps them synthesize and remember their learning and gives you a chance to evaluate how well they grasped the new idea or skill; reflection is essential to learning

Tips for Elaborating and Evaluating

- **It can be tempting to run an activity right up to the end of your time together and say, “No time to reflect,” but it’s crucial to cut your activity a few minutes short to ensure a few minutes for closure.**
- **Gather as a group, revisit the purpose of the lesson, and invite students to demonstrate what they learned.**
- **Invite students to take their learning with them in a meaningful way, like replicating a recipe at home or repeating a skill they’ve practiced in a future class.**



5 Es Cheat Sheet

Remember to keep the 5 Es in mind whenever you lead a lesson—no matter how long. If you find yourself in a situation where you have a short amount of time with students, here’s a “cheat sheet” of what to remember to do:

Engage

- Gather your students in a circle. Transition to “FoodCorps Time,” promote excitement, and ask questions. Review the group agreements.
- Lead an opening activity. Consider using a “do now”—a short activity awaiting students when they enter the classroom. Students should be able to complete the do-now activity without your direction. It can preview the FoodCorps lesson or review a previous lesson. An example would be as follows: Write the following for students to see: “Work with a partner to design a dinner menu that captures your cultures, traditions, and favorite foods. If time allows, draw this meal to share visually.”

Explore

- Have students disperse in the learning space to explore materials or ideas *before* they are fully explained. Call students back in an engaging way.

Explain

- Lead your lesson. Demonstrate a new skill or concept, then engage students in the lesson using multiple modalities and hands-on teaching methods. Adapt your lesson to build on students’ prior knowledge.

Elaborate/Evaluate

- Always leave time for a closing activity or conversation to promote reflection. Prioritize asking questions that are process-oriented, such as, *When we were learning about each other’s culture and traditions, what were some ways we showed respect and appreciation for one another?* And ask questions that are content-oriented: *What were some things you learned about food?* With students in upper grades, you can use a “ticket out the door” strategy by asking students to write “Something I Learned,” “Questions I Have,” and “Something Important to Remember.” They can then submit this as they leave.

Recommended Resources

- Biological Science Curriculum Study (BSCS) Overview of the 5 E Instructional Model website

Overview of FoodCorps Lesson Themes

The six FoodCorps themes listed below provide a framework for service members to identify the central topic for each lesson. Living up to Our Full Potential; Making Healthy Food Choices; Exploring the Ecology of Food; and Connecting to Food, Culture, and Community are all conceptual themes. In the lessons under these themes, students are primarily working on building their knowledge of these central ideas. Growing and Accessing Healthy Food and Preparing Healthy Food are skills-focused themes, and in the lessons under these two themes, students are developing their skills in gardening, cooking, and accessing healthy foods.

Theme: Living Up to Our Full Potential

This is the first “bookend” of the FoodCorps lesson themes. Lessons under this theme focus on growing positive connections with one another, healthy food, and the environment. Students reflect on how these relationships help us live up to our full potential and emphasize practices that support social and emotional learning. Sample lessons: If Our Class Were a Soup . . . , All in for Applesauce, Getting to Know the Garden

Theme: Making Healthy Food Choices

Lessons under this theme focus on exploring big-picture concepts that guide healthy eating such as balancing the food groups, discovering our individual food preferences, and examining external factors that influence our food decisions.

Sample lessons: Eat a Rainbow, Mindful Tasting, Tortilla Time, Cafeteria Mentors, The Secret Strategies of Food Advertising

Theme: Exploring the Ecology Of Food

Lessons under this theme focus on the scientific concepts that relate to food and food systems. Such key

ideas include how plants grow, food webs, cycles, and the ecological impacts of the food system.

Sample lessons: Get to Know a Crop, What Do Plants Eat? How Seeds Travel, World Travels of Food, Insect Homes, Look Closely at Leaves

Theme: Growing and Accessing Healthy Food

Lessons under this theme focus on garden-based skills to grow healthy food and community advocacy skills to help improve access to healthy food.

Sample lessons: Plant a Rainbow, Worm Bin Wonders, Garden Grids, Changemakers, Saving Seeds

Theme: Preparing Healthy Food

Lessons under this theme focus on the skills required to prepare and enjoy a variety of healthy foods together. As students get older, the cooking activities become more complex and independent and involve meal planning and goal-setting in addition to food preparation.

Sample lessons: Sauté, Salad Dressing Challenge, Rolling into Spring

Theme: Connecting to Food, Culture, and Community

This is the last “bookend” of our themes. Lessons under this theme are all intended as year-end culminating activities in which students give thanks for their food, and make connections between healthy foods and their personal culture, school culture, or world cultures.

Sample lessons: Our Food Traditions, Mealtime Traditions around the World, Gratitude Feast



FoodCorps K-5 Grade Lessons Learning Progression

The Learning Progression below illuminates the theory behind the sequencing of the ninety-six FoodCorps lessons. It articulates how these lessons relate to and build upon one another to support students in developing increasingly sophisticated knowledge of and skills in the six themes listed above. In other words, this Learning Progression is a road map intended to highlight where we're headed with our lessons and how each activity helps us get there.

Kindergarten

In the fourteen FoodCorps kindergarten lessons, students engage in a range of gardening, food preparation, and tasting activities through which they discover that the foods we eat come from plants and animals; that plants all require sun, soil, water, and air to thrive; that there is a wide variety of healthy foods to enjoy; and that our preferences for these foods can change over time. They connect these concepts by sprouting beans and making a bean dip, planting sunflower seeds, making a sunflower seed snack, and exploring their own food preferences. They wrap up the year with a focus on gratitude for the people who feed us. Please refer to the Lesson-at-a-Glance Chart for lesson titles and descriptions.

First Grade

Building on what they learned in kindergarten, in the fourteen FoodCorps first grade lessons, students discover that plants have distinct structures (i.e., roots, stems, leaves, flowers, fruits and seeds), and foods can be categorized into distinct groups (i.e., “go foods,” like grains, can give us energy; “grow foods,” like meat and beans, can help us build muscle; and “glow foods,” like fruits and vegetables, can support our immunity and overall health). Through classifying foods into these groups, planning and preparing snacks and

meals that balance these groups, and planting crops from each group, students discover the essential role each food group plays in supporting their health and allowing them to live up to their full potential. Similarly, through hands-on activities such as looking for the six plant parts in the garden, categorizing plant parts, building imaginary plants, planting a “tops and bottoms” bed with root and leaf crops, and making “plant part wraps” and “tops and bottoms popsicles,” students begin to understand that each structure of the plant serves a distinct function that helps the plants survive and reproduce, and these plant parts also play an integral role in our diet. Please refer to the Lesson-at-a-Glance Chart for lesson titles and descriptions.

Second Grade

Building on what they learned in first grade, in the fourteen FoodCorps second grade lessons, students explore the value of diversity in their community, in the natural world, and in their diets. They start the year reflecting on what each student contributes to the class community. Then they learn about the value of “eating a rainbow” of fruits and vegetables to support overall health by learning about what fruits and vegetables of different colors can do to support our bodies, preparing rainbow salads, and planting a rainbow. Meanwhile, in the garden they explore biodiversity and interdependence with a focus on how animals help transport pollen and seeds. In the classroom, they research foods eaten around the world and wrap up the year by swapping food stories with one another. Please refer to the Lesson-at-a-Glance Chart for lesson titles and descriptions.

Third Grade

Building on what they learned in second grade, in the fourteen FoodCorps third grade lessons, students

dive into a journey of food from farm to fork. They explore a variety of foods on the spectrum from whole to processed and trace the sources of common processed foods back to the farm, and, ultimately, to sun, soil, water, and air. They also process their own foods, including applesauce, pickles, tortillas, crackers, and more. In the garden, they compost with worms and discover how the process of decomposition allows food to go from fork back again to the farm. Finally, they explore their own community to discover places where whole and minimally processed foods are available and accessible. Please refer to the Lesson-at-a-Glance Chart for lesson titles and descriptions.

Fourth Grade

Building on what they learned in third grade, in the fourteen FoodCorps fourth grade lessons, students examine their personal preferences for foods and explore the individual and societal factors that influence these preferences. They become more independent in food preparation by developing simple recipes for seasoning popcorn, making salad dressing, and planning healthy snacks to reflect their preferences and also what they've learned about healthy eating. Simultaneously, students examine the environmental impact of food choices as well as issues in equity of access to healthy foods, with a specific focus on how they can be agents of change within their school food system. Please refer to the Lesson-at-a-Glance Chart for lesson titles and descriptions.

Fifth Grade

Building on what they learned in fourth grade, in the fourteen FoodCorps fifth grade lessons, students start the year by creating a Full Potential Manifesto to identify achievable steps that will help them work toward living up to their full potential. Then they turn their attention to evaluating claims about food through interpreting nutrition labels and analyzing food advertisements. Meanwhile, they explore natural cycles and systems in the food system by mapping how matter cycles through the garden, moving from air and water into plants through photosynthesis; from plants to humans through harvesting and eating; and from humans to soil through building compost. They also explore how the seasonal cycle influenc-

es the food system and apply this knowledge by preparing recipes that can be modified to incorporate seasonal ingredients. These include a variety of pestos, a soup, and spring rolls. Finally, in fifth grade, students continue their efforts to become agents of change, broadening their focus from schoolwide to community-wide change. Please refer to the Lesson-at-a-Glance Chart for lesson titles and descriptions.

FoodCorps Lesson Topic Clusters

The FoodCorps lessons below are grouped in mini-topic clusters. The lessons within a given cluster use multiple strategies to address a particular concept. For example, students learn the concept of “go, grow, glow” foods in the first lesson, make a snack with those foods in the second lesson, and plant go, grow, glow foods to reinforce the concept in the third

lesson. Please use this list as a reference for lessons that might be interesting to teach as a grouping. Note that there are lessons in some groupings that span multiple grades. Don’t let this deter you from adapting each lesson to meet the specific needs of your group of students.

Basic Plant Needs (kindergarten)	Page
Up, Up, Up We Grow!	55
Let Us Grow Lettuce!	62
Fabulous Five	66
Bean Buddies	88
Foundations of Where Food Comes from (kindergarten)	
Who Eats What?	84
Perfect Parfaits	98
Plant Parts (1st grade)	
Plant Part Scavenger Hunt	125
Planting a Tops and Bottoms Bed	128
Plant Part Wraps	131
Plant Part Mystery	149
Imaginary Plants	166
Tops and Bottoms Popsicles	174
Go, Grow, Glow (1st grade)	
Go, Grow, Glow	121
Go, Grow, Glow Quesadillas	158
Planting a Go, Grow, Glow Bed	170

Eat a Rainbow (2nd grade)	
Eat a Rainbow	191
Plant a Rainbow	197
Rainbow at the Salad Bar	224
Rainbow Grain Salad	235
Rainbow Smoothie (kindergarten)	80
Sunflower Seeds (kindergarten)	
Sunflower House	102
Sunny Honey Seed Snacks	106
Seeds (2nd grade)	
Bean Buddies (kindergarten)	88
Saving Seeds	203
How Seeds Travel	212
Seed Tape	217
Insects (2nd grade)	
Be a Bee!	228
Planting for Beneficial Insects	231
Insect Homes	246

Stone Soup (2nd grade)	
If Our Class Were a Soup . . .	188
Stone Soup (5th grade)	451
Worms (3rd grade)	
Worm Bin Wonders	272
Exploring Our Worm Bin	293
Staple Grains (3rd grade)	
Tortilla Time!	286
Breaking Down Rocks, Building Up Bread	303
Whole Grain Crackers	314
Processed vs. Whole Foods (3rd grade)	
Get to the Source	255
Let's Jam!	289
Food System (4th grade)	
Neighborhood Food Maps (3rd grade)	300
World Travels of Food	361
Food Packaging	378
Flavor Profiles (4th grade)	
Choose-Your-Own-Flavor Popcorn	341
Salad Dressing Challenge	368

Planning and Designing Garden Space (4th grade)	
Garden Grids	382
Seed Tape	217
A Patchwork Garden Quilt	365
Salsa (4th grade)	
Plant a Salsa Bed	400
What's in My Salsa? (5th grade)	410
Decomposition (5th grade)	
Cycle of a Nutrient	462
Break it Down	467
Rotting Away, Day by Day	477
Energy Transfer (5th grade)	
What Do Plants Eat?	412
Web of Life	438
Setting Goals (5th grade)	
Full Potential Manifesto	406
Gratitude Feast	473
Celebratory Lessons	
Tea Time	140
Stone Soup	451
Celebrating the Autumn Harvest	281
Gratitude Feast	473

FoodCorps Lesson Short Lists

The lists below have been designed for easy reference when trying to identify which lesson to choose in a specific teaching scenario. For instance, if you want to get crafty, you might search for a lesson under the “Lessons that Feature Arts and Crafts” list. If you are trying to focus on literacy with students, reference the “Lessons with a Literature Connection” list. Do you want to do some cooking with students but don’t have a stove? Check out the “Cooking-Related: Don’t Require Heat or Electrical Source During Lesson” list.

Garden Lessons

LESSON	PAGE
Biodiversity in the Garden	195
Break It Down	467
Celebrating the Autumn Harvest	281
Fabulous Five: What a Plant Needs to Thrive	66
Garden Grids	382
Getting to Know the Garden	343
Insect Homes	246
Let Us Grow Lettuce!	62
Looking Closely at Leaves	183
Plant a Go, Grow, Glow Bed	170
Plant a Pizza	112
Plant a Rainbow	197
Plant a Salsa Bed	400
Plant Families	320
Planting a Tops and Bottoms Bed	128
Planting for Beneficial Insects	231
Planting the Three Sisters	309
Putting the Garden to Bed	429
Rotting Away, Day by Day	477
Saving Seeds	203
Sensory Explorations	118
Tea Time	140
That’s Life!	268

Lessons with a Literature Connection

LESSON	BOOK	PAGE
Agents of Change	<i>Harvesting Hope: The Story of Cesar Chavez</i> by Kathleen Krull	335
Bean Buddies	<i>One Bean</i> by Anne Rockwell	88
Bee a Bee!	<i>UnBelievables</i> by Douglas Florian	228
Breaking Down Rocks, Building Up Bread	<i>Bread, Bread, Bread</i> by Anna Morris or <i>Bread is for Eating</i> by David and Phyllis Gershator	303
Budding Tastes	<i>Sylvia's Spinach</i> by Katherine Pryor, or <i>I Will Never Not Ever Eat a Tomato</i> by Lauren Child	94
Exploring Our Worm Bin	<i>Wiggling Worms at Work</i> by Wendy Pfeffer	293
Go, Grow, Glow Quesadillas	<i>Round is a Tortilla</i> by Roseanne Greenfield Thong	158
How Seeds Travel	<i>A Fruit is a Suitcase for Seeds</i> by Jean Richards	212
If Our Class Were a Soup . . .	<i>Stone Soup</i> by Jon J. Muth	188
Life on the Farm	Summer Sun Risin' by W. Nikola-Lisa	318
People Who Feed Us	<i>Before We Eat: From Farm to Table</i> by Pat Brisson or <i>Zora's Zucchini</i> by Katherine Pryor	109
Plant a Pizza	<i>All the Way to America: The Story of a Big Italian Family and a Little Shovel</i> by Dan Yaccarino <i>Fidget Grows a Pizza Garden</i> by Jodie Fitz <i>How a Seed Grows</i> by Helene J. Jordan	112
Plant a Salsa Bed	<i>Farmer Will Allen and the Growing Table</i> by Jacqueline Briggs Martin	400
Plant Part Mystery	<i>Tops & Bottoms</i> by Janet Stevens	149
Planting a Tops and Bottoms Bed	<i>Tops & Bottoms</i> by Janet Stevens	128
Stone Soup	<i>Stone Soup</i> by Jon J. Muth	451
Sunflower House	<i>Sunflower House</i> by Eve Bunting	102
That's Life!	<i>Pumpkin Circle</i> by George Levenson or <i>The Tiny Seed</i> by Eric Carle	268
The World Travels of Food	<i>How to Make an Apple Pie and See the World</i> by Marjorie Priceman	361
Tortilla Time!	<i>The First Tortilla</i> by Rudolfo Anaya	286
Veggie Wraps	<i>Rah, Rah, Radishes!</i> by April Pulley Sayre	64
Who Eats What?	<i>My Very First Book of Food</i> by Eric Carle	84

Lessons with a Science Connection

LESSON	NEXT GENERATION SCIENCE STANDARD CONNECTION	PAGE
Be a Bee!	NGSS 2.LS2.A Interdependent Relationships in Ecosystems Plants depend on animals for pollination or to move their seeds around.	228
Bean Buddies	NGSS K.LS1.C Organization for Matter and Energy Flow in Organisms – All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow. NGSS 1.LS1.A Structure and Function – All organisms have external parts . . . Plants also have different parts (roots, stems, leaves, flowers, fruits, and seeds) that help them survive and grow.	88
Biodiversity in the Garden	NGSS.LS4.D Biodiversity and Humans There are many different kinds of living things in any area, and they exist in different places on land and in water.	195
Break It Down	NGSS.LS.2.A The food of almost any animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants, while decomposers restore some materials back to the soil.	467
Cycle of a Nutrient	NGSS.LS.2.A. The food of almost any animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants, while decomposers restore some materials back to the soil.	462
Exploring Our Worm Bin	NGSS 3.LS4.D Populations live in a variety of habitats, and change in those habitats affects the organisms living there.	239
Fabulous Five: What a Plant Needs to Thrive	NGSS, Life Science Disciplinary Core Idea LS1.C: Organization for Matter and Energy Flow in Organisms. All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow. (K-LS1-1)	66
Getting to Know the Garden	NGSS 4-LS1-2. Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.	343
How Seeds Travel	NGSS.LS2.A Interdependent Relationships in Ecosystems • Plants depend on water and light to grow. • Plants depend on animals for pollination or to move their seeds around.	212
Imaginary Plants (FrankenPlants)	NGSS 1.LS1.A Structure and Function – All organisms have external parts . . . Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow.	166

Insect Homes	<p>NGSS, Life Science Disciplinary Core Idea LS4.D: Biodiversity and Humans There are many different kinds of living things in any area, and they exist in different places on land and in water. (2-LS4-1)</p> <p>K-2.ETS1.B: Developing Possible Solutions Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people (K-2-ETS1-2)</p>	246
Let Us Grow Lettuce!	<p>NGSS K.LS1.C. All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow.</p>	62
Looking Closely at Leaves	<p>NGSS LS3.B: Variation of Traits Individuals of the same kind of plant or animal are recognizable as similar but can also vary in many ways. (1-LS3-1)</p>	183
Perfect Parfaits	<p>NGSS K.LS1.C Organization for Matter and Energy Flow in Organisms – All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow.</p>	98
Plant a Rainbow	<p>NGSS .LS4.D Biodiversity and Humans There are many different kinds of living things in any area, and they exist in different places on land and in water.</p>	197
Plant Families	<p>NGSS, Life Science Disciplinary Core Idea NGSS LS3.A: Inheritance of Traits Many characteristics of organisms are inherited from their parents. (3-LS3-1) Other characteristics result from individuals' interactions with the environment, which can range from diet to learning. Many characteristics involve both inheritance and environment. (3-LS3-2)</p> <p>NGSS LS3.B: Variation of Traits Different organisms vary in how they look and function because they have different inherited information. (3-LS3-1) The environment also affects the traits that an organism develops. (3-LS3-2)</p>	320
Plant Part Mystery	<p>NGSS LS1.A Structure and Function—All organisms have external parts . . . Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow.</p>	149
Plant Part Scavenger Hunt	<p>NGSS LS1.A Structure and Function – All organisms have external parts . . . Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow.</p>	125
Plant Part Wraps	<p>NGSS LS1.A Structure and Function – All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water, and air. Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow.</p>	131

Planting a Tops and Bottoms Bed	<p>NGSS: LS1.A All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water, and air. Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow.</p>	128
Planting for Beneficial Insects	<p>NGSS.LS2.A Interdependent Relationships in Ecosystems</p> <ul style="list-style-type: none"> • Plants depend on water and light to grow. • Plants depend on animals for pollination or to move their seeds around. 	231
Putting the Garden to Bed	<p>NGSS, Life Science Disciplinary Core Idea LS2.A: Interdependent Relationships in Ecosystems The food of almost any kind of animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. Some organisms, such as fungi and bacteria, break down dead organisms (both plants or plants parts and animals) and therefore operate as “decomposers.” Decomposition eventually restores (recycles) some materials back to the soil. Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem. (5-LS2-1)</p>	429
Root-View Cups	<p>NGSS 1.LS1.A Structure and Function – All organisms have external parts . . . Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow.</p>	154
Rotting Away, Day by Day	<p>NGSS, Life Science Disciplinary Core Idea LS2.A: Interdependent Relationships in Ecosystems The food of almost any kind of animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. Some organisms, such as fungi and bacteria, break down dead organisms (both plants or plants parts and animals) and therefore operate as “decomposers.” Decomposition eventually restores (recycles) some materials back to the soil. Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem.</p>	477
Saving Seeds	<p>NGSS, Life Science Disciplinary Core Idea LS2.A: Interdependent Relationships in Ecosystems Plants depend on water and light to grow. (2-LS2-1) Plants depend on animals for pollination or to move their seeds around. (2-LS2-2)</p> <p>3rd Grade NGSS NGSS LS3.A LS3.A: Inheritance of Traits Many characteristics of organisms are inherited from their parents. (3-LS3-1) Other characteristics result from individuals’ interactions with the environment, which can range from diet to learning. Many characteristics involve both inheritance and environment. (3-LS3-2)</p> <p>NGSS LS3.B LS3.B: Variation of Traits Different organisms vary in how they look and function because they have different inherited information. (3-LS3-1)The environment also affects the traits that an organism develops. (3-LS3-2)</p>	203

Sunflower House	NGSS K.LS1.C. Organization for Matter and Energy Flow in Organisms – All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow.	102
That's Life!	NGSS.LS1.B Growth and Development of Organisms Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles.	268
Web of Life	NGSS 5-PS3-1. Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun. NGSS 5-LS2-1. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.	438
What Do Plants Eat?	NGSS.LS1.C. Food provides animals with the materials they need for body repair and growth and the energy they need to maintain body warmth and for motion. Plants acquire their material for growth chiefly from air and water.	412
Who Eats What?	NGSS K.LS.1.C All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow.	84
World Travels of Food	NGSS ESS.3.C Human Impacts on Earth Systems – Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth's resources and environments.	361
Worm Bin Wonders	NGSS LS.4.D Populations live in a variety of habitats, and change in those habitats affects the organisms living there.	272

Lessons with a Math Connection

LESSON	COMMON CORE MATH STANDARD CONNECTION	PAGE
A Patchwork Garden Quilt	CCSS.MATH.CONTENT.4.MD.A.1 Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ...	365

From Beautiful Beans to Delicious Dip!	<p>CCSS.MATH.CONTENT.K.MD.B.3. Classify objects into given categories; count the number of objects in each category and sort the categories by count.</p> <p>CCSS.MATH.CONTENT.K.CC.C.6. Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies.</p>	91
Fun with Fruit Salad	<p>CCSS.MATH.CONTENT.2.OA.C.3 Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.</p>	200
Garden Grids	<p>CCSS.MATH.CONTENT.4.MD.A.3 Apply the area and perimeter formulas for rectangles in real world and mathematical problems. For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.</p>	382
How Seeds Travel	<p>Work with equal groups of objects to gain foundations for multiplication. CCSS.MATH.CONTENT.2.OA.C.3 Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.</p>	212
Perfect Parfaits	<p>CCSS.MATH.CONTENT.K.CC.B.5 Count to answer “how many?” questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1-20, count out that many objects.</p>	98
Seed Tape	<p>CCSS.MATH.CONTENT.2.OA.C.3 Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.</p>	217
Sugar Showdown	<p>Convert like measurement units within a given measurement system.</p> <p>CCSS.MATH.CONTENT.5.MD.A.1 Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.</p> <p>CCSS.MATH.CONTENT.5.MD.C.3 Recognize volume as an attribute of solid figures and understand concepts of volume measurement.</p>	455

World Travels of Food	CCSS.MATH.CONTENT.5.NBT.A.1 Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.	361
	CCSS.MATH.CONTENT.5.NBT.A.2 Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.	

Cooking-Related: Lessons That Require Heat or Electrical Source

LESSON	PAGE
All in for Applesauce	252
From Beautiful Beans to Delicious Dip!	91
Go, Grow, Glow Quesadillas	158
Rainbow Smoothie	80
Reimagined Snacks	386
Sauté	220
Stone Soup	451
Tea Time	140
Tortilla Time!	286
Whole Grain Crackers	314

Cooking-Related: Lessons That Don't Require Heat or Electrical Source

LESSON	PAGE
Choose-Your-Own-Flavor Popcorn*	341
Fun with Fruit Salad	200
Gratitude Feast**	473
Green Sauce around the World	423
Let's Jam	289
Perfect Parfaits	98
Plant Part Wraps	131
Quick, Pickle That!*	277
Rainbow Grain Salad*	235
Rolling into Spring*	470

Root Fruit Slaw	297
Salad Dressing Challenge	368
Sunny Honey Seed Snacks	106
The Great Balancing Act	143
Tops and Bottoms Popsicles*	174
Veggie Wraps	64
What's In My Salsa?	410

* These lessons don't require heat or electricity during the lesson itself but do require it during lesson preparation or follow-up.

** This lesson lets students and teachers choose what to prepare, so the equipment requirements will depend on what you choose to make.

Songs That Are Included in FoodCorps Lessons

LESSON	SONG	PAGE
Imaginary Plants	"Roots, Stems, Leaves" by the Banana Slug String Band	166
Let Us Grow Lettuce!	"Sun, Soil, Water, Air" by the Banana Slug String Band	62
Plant Part Scavenger Hunt	"Roots, Stems, Leaves" by the Banana Slug String Band	125
Root-View Cups	"My Roots Go Down" by Sarah Pirtle	154
Up, Up, Up We Grow!	"Sun, Soil, Water, Air" by the Banana Slug String Band	55

Lessons That Feature Arts and Crafts

LESSON	PAGE
Be a Bee!	228
Budding Tastes	94
Cycle of a Nutrient	462
Eat a Rainbow	191
Full Potential Manifesto	406
Go, Grow, Glow	121
Gratitude Feast	473
If Our Class Were a Soup . . .	188
Imaginary Plants	166
Insect Homes	246
Let Us Grow Lettuce!	62
Looking Closely at Leaves	183
Neighborhood Food Maps	300

People Who Feed Us	109
Plant a Pizza	112
Plant a Rainbow	197
Planting a Tops and Bottoms Bed	128
Root-View Cups	154
Saving Seeds	203
Seasonal Food Wheels	419
The Secret Strategies of Food Advertising	434
Who Eats What?	84

Lessons That Require More Than One Session

LESSON	DESCRIPTION OF SESSIONS	PAGE
Agents of Change	The first session focuses on hearing about a food activist, brainstorming food and health issues within the school, and generating ideas for solutions. The second session focuses on implementing the solution.	335
Becoming Cafeteria Mentors	The first session focuses on learning to navigate the cafeteria salad bar and preparing to present to younger students. The second session focuses on presenting to younger students.	356
Changemakers	The first session focuses on hearing about a food activist, brainstorming food and health issues within the community, and generating ideas for solutions. The second session focuses on implementing the solution.	445
Get to Know a Crop	The first session focuses on students researching a crop. The second session focuses on students presenting arguments for whether they should grow that crop in their school garden.	331
Gratitude Feast	The first session focuses on planning a gratitude feast. The second session focuses on hosting the feast.	473
Learning from Our Elders	The first session focuses on preparing to interview elders about food and healthy eating. The second session focuses on hosting elders to share stories with the class.	372
Rotting Away, Day by Day	In this lesson, students look for signs of decomposition in the garden, consider the various factors that influence the rate of decomposition, and then bury a specific object that they unearth a couple weeks later to observe. This lesson can be taught in conjunction with “Break it Down” and “The Nutrient Cycle.”	477

FoodCorps Lessons In Alphabetical Order

LESSONS (96 TOTAL)	PAGE
Agents of Change	335
All in for Applesauce	252
A Patchwork Garden Quilt	365
A Rainbow at the Salad Bar	224
Be a Bee!	228
Bean Buddies	88
Becoming Cafeteria Mentors	356
Biodiversity in the Garden	195
Break It Down	467
Breaking Down Rocks, Building Up Bread	303
Budding Tastes	94
Celebrating the Autumn Harvest	281
Changemakers	445
Choose-Your-Own-Flavor Popcorn	341
Cycle of a Nutrient	462
Eat a Rainbow	191
Exploring Our Worm Bin	293
Fabulous Five	66
Food Memory Tourists (Food Memories)	326
Food Packaging	378
Food Story Swap	243
From Beautiful Beans to Delicious Dip	91
Full Potential Manifesto	406
Fun with Fruit Salad	200
Garden Explorations	46
Garden Grids	382
Get to Know a Crop	331
Get to the Source	255
Getting to Know the Garden	343
Go, Grow, Glow	121
Go, Grow, Glow Quesadillas	158

Gratitude Feast	473
Green Sauce around the World	423
How Seeds Travel	212
If Our Class Were a Soup	188
Imaginary Plants (FrankenPlants)	166
Insect Homes	246
Learning From Our Elders	372
Let Us Grow Lettuce!	62
Let's Jam	289
Life on the Farm (Summer Sun Risin')	318
Looking Closely at Leaves	183
Mealtime Traditions around the World	392
Mindful Tasting	52
Neighborhood Food Maps	300
Our Food Traditions	177
People Who Feed Us	109
Perfect Parfaits	98
Plant a Go, Grow, Glow Bed	170
Plant a Pizza	112
Plant a Rainbow	197
Plant a Salsa Bed	400
Plant Families	320
Plant Part Mystery	149
Plant Part Scavenger Hunt	125
Plant Part Wraps	131
Planting a Tops and Bottoms Bed	128
Planting for Beneficial Insects	231
Planting the Three Sisters	309
Poetic Produce	328
Putting the Garden to Bed	429
Quick, Pickle That!	277
Rainbow Grain Salad	235

Rainbow Smoothie	80
Reimagined Snacks	386
Rolling into Spring	470
Root Fruit Slaw	297
Root-View Cups	154
Rotting Away, Day by Day	477
Salad Dressing Challenge	368
Sauté	220
Saving Seeds	203
Seasonal Food Wheels	419
Seed Tape	217
Sensory Explorations	118
Stone Soup	451
Sugar Showdown	455
Sunflower House	102
Sunny Honey Seed Snacks	106
Tea Time	140

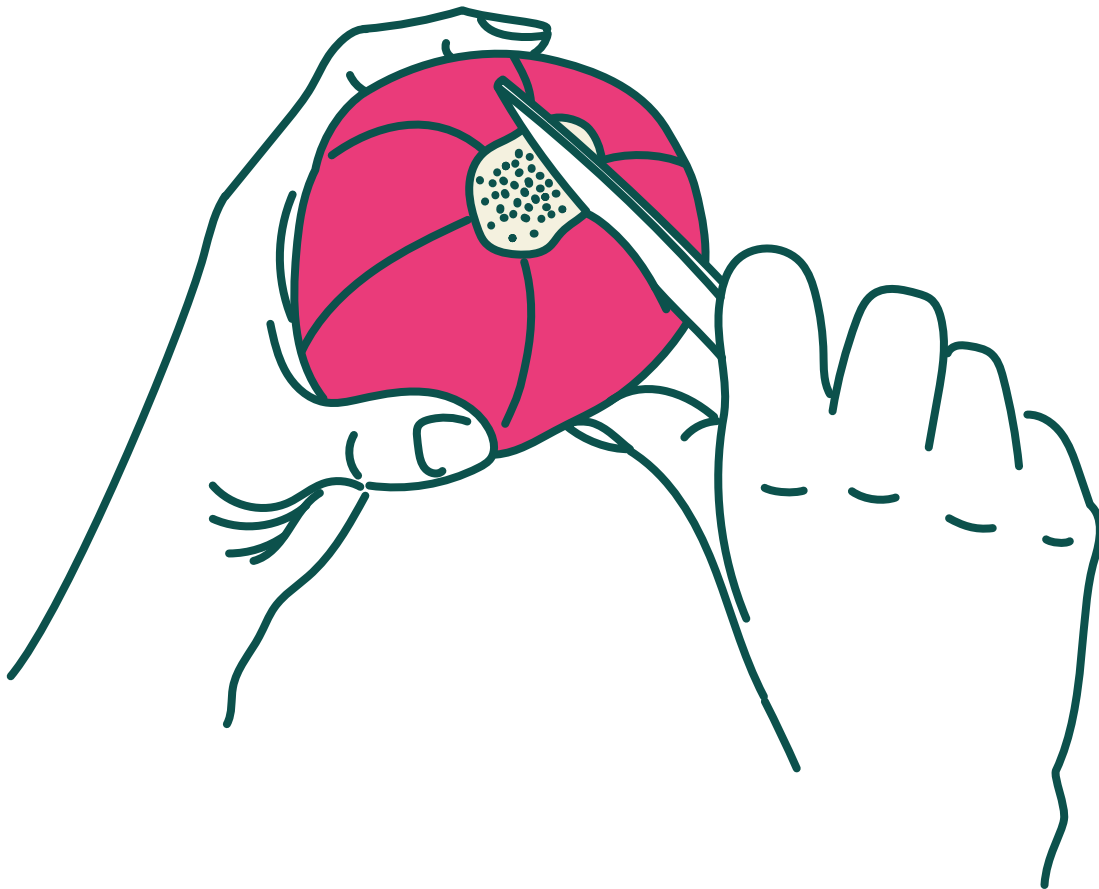
That's Life!	268
The Great Balancing Act	143
The Secret Strategies of Food Advertising	434
Tops and Bottoms Popsicles	174
Tortilla Time!	286
Up, Up, Up We Grow!	55
Veggie Wraps	64
Web of Life	438
What Do Plants Eat?!	412
What's in My Salsa?	410
What the World Eats	208
Who Eats What?	84
Whole Grain Crackers	314
Wonders of Water	162
World Travels of Food	361
Worm Bin Wonders	272

Lessons with Project-Based Learning Opportunities

Lessons with Project-Based Learning Opportunities

Project-based learning (PBL) is an educational approach in which students design and engage in an extended, real-world hands-on project as a way to learn about something and/or apply their learning within a meaningful context. Successful projects begin with robust driving questions that the students generate themselves and allow students to actively investigate solutions to complex problems. The Buck Institute for Education provides planning guides, grading rubrics, how-to videos, and more to support teachers in designing and facilitating quality PBL at www.bie.org.

See Changemakers on p. 445 and Agents of Change on p. 335 as examples of lessons that can be used for PBL.



Service Member Notes

Please use this space to jot down notes to help you prepare for leading hands-on lessons. This is a great space to record ideas for adapting a lesson to meet the needs of your students and reflect the local culture and wisdom shared by community members and partners. Remember to also include ideas shared by school staff and teachers, from tips about the ideal time to lead a specific lesson in the garden to how the lesson might connect to state or district standards.

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FOODCORPS LESSONS

These lessons were developed by FoodCorps in collaboration with FoodCorps alumni, trainers, and partners in the field. We truly appreciate the input from this team and look forward to expanding FoodCorps Lessons to meet the needs of our corps in the future. A special thanks to Presenting Sponsor Target, FoodCorps National Leader for Healthy Kids.

PRESENTING SPONSOR



FoodCorps National Leader for Healthy Kids

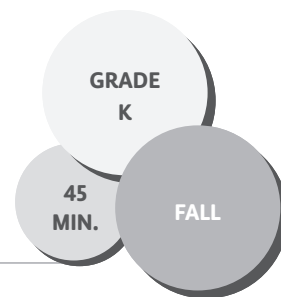




Grade K LESSONS

Garden Explorations

THEME: LIVING UP TO OUR FULL POTENTIAL



ESSENTIAL QUESTION

How can we be kind to the living things in the garden, including plants, animals, and people?

LEARNING OBJECTIVE

✓ Students will be able to explain the care and safety agreements they will follow in the garden.

LESSON DESCRIPTION

This lesson serves as an introduction to the garden by providing exploratory time and reviewing garden agreements.

MATERIALS

- Garden Hunt Cards (pp. 49-51)
- 1 Poster board
- Markers
- Chime or whistle (optional)

PREPARATION

- › Print and presort Garden Hunt Cards to ensure you have enough pairs for the size of your class, and take out any cards with images of objects that students wouldn't find in your school's garden. Be sure to have multiple copies of the same pairs.

ACTION STEPS

1. Making Introductions: Gather students in a circle and, one at a time, have them say their

name and something about themselves, such as their favorite fruit or vegetable or their favorite thing to do outside. **(5 min.)**

2. Playing Garden I Spy: Demonstrate how to play I spy. Give an example such as *I spy with my little eye something that is really tall and has a yellow flower*. Accept guesses from students about what the object is. Then assign students partners, and have them play in pairs, taking turns with spying and finding objects. Before sending students out to explore, let them know the physical boundaries for their exploration and how you will be calling them back, such as by saying, *When you hear me crow like a rooster, it's time to come back to this spot and gather in a quiet circle to hear what's next*. Use this same callback strategy every time with this group so they become accustomed to it. Options include crowing like a rooster, howling like a coyote, ringing a chime, blowing a whistle, or using a call-and-response chant. You might also ask the classroom teacher what strategy the class uses daily and adopt that. **(10 min.)**

3. Developing Group Agreements: Use your callback strategy to gather students back together. Once they're gathered, ask, *Did you see any living things in the garden?* Lead

students to consider how they could care for the living plants and creatures, including themselves, while they are in the garden. Explain, *It's important that we pay attention and keep all those living things safe and cared for.* Ask the following questions, one at a time: *How can we keep plants safe and cared for? How can we keep insects and other critters safe and cared for? How can we keep each other safe and cared for?* As students share answers to each question, summarize their ideas, and develop a few care and safety agreements that they can follow when they are in the garden. Keep the agreements as brief as possible. Record these so you can refer to them each time this group visits the garden. **(10 min.)**



4. Touring Care and Safety Agreements: Create fun, physical, and interactive ways to review the care and safety agreements. For example, if

you have the agreement *Feet on the path!* have students march in place and chant the agreement. Or, for *Harvest with two hands*, have them raise two hands and wiggle their fingers. So when you need to remind students about the agreement later, you have a hand gesture to reinforce it. Consider taking students on a tour or parade through the garden to practice the agreements. As you're marching, ask questions such as, *Can I pick this?* Have students chant back an agreement such as *Ask before trying.* **(5 min.)**

5. Playing Garden Hunt Matching Game: Show students the Garden Hunt Cards, and explain that they'll play a game where they'll find their partner by finding who has the same card. Once they find their partner, have the pair hunt around in the garden for what is pictured on their card. After they've found their object, tell them to come back to your gathering space. Whenever a pair comes back, send them out for a second or third round by giving them a new object to find. As they play, walk around the garden and reinforce the expectations by saying things such as, *You're being very careful to protect our plants by staying on the pathways!* or *It was thoughtful of you to leave that worm alone when you found it.* Also remind students that when we care for the edible plants (i.e., the plants we eat) growing in the garden, we are caring for the people who will eat them after they are harvested. **(10 min.)**

After the class has finished, create an illustrated poster that you can continue to post agreements on and refer to in future lessons.

Include the agreements you developed together, including at least one example under each of the following three headings: Taking Care of Plants, Taking Care of Animals, and Taking Care of Ourselves.

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *What was your favorite thing you saw in the garden today?*
- *What do you look forward to doing in the garden?*
- *What is one of the care and safety agreements that's important to remember while you're in the garden?*
- *Why is it important to be safe and show care in the garden?*

ADAPTATIONS

Variation: Instead of using the Garden Hunt Cards, you can pass out leaves you've picked from different plants in the garden. Then students can find their classmate with the same leaf and together find the plant that the leaf belongs to.

Art: Once students find their object, have them sit with their partner and each draw the object on paper. Alternately, have students draw a map of the garden.

ACADEMIC CONNECTIONS

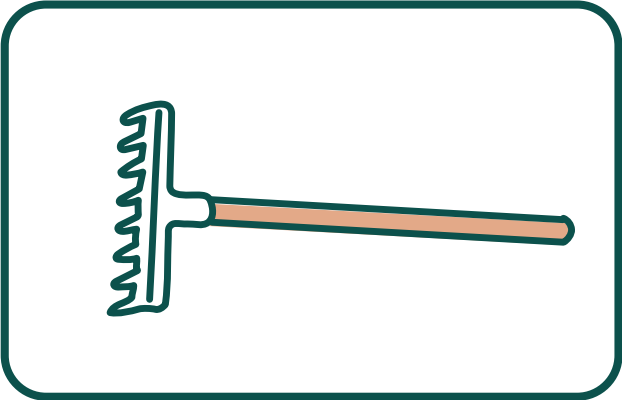
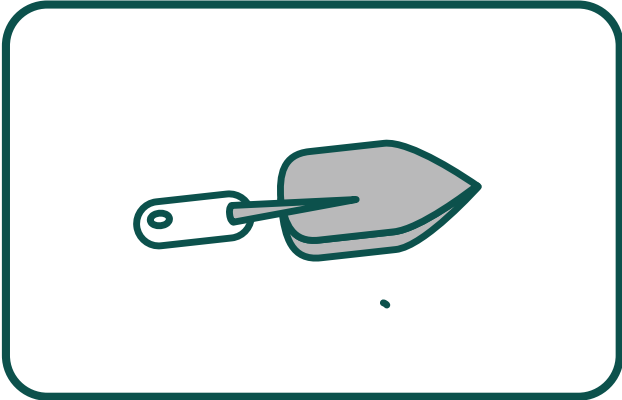
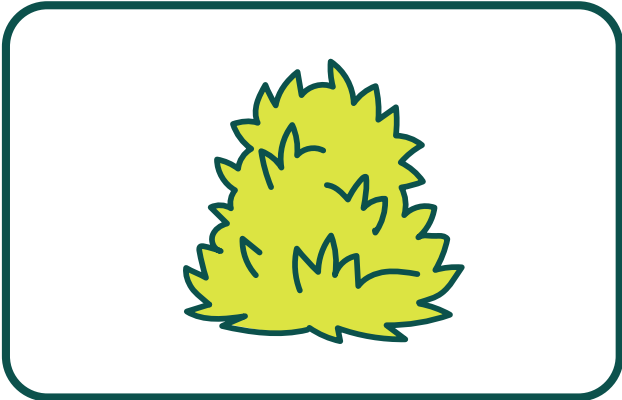
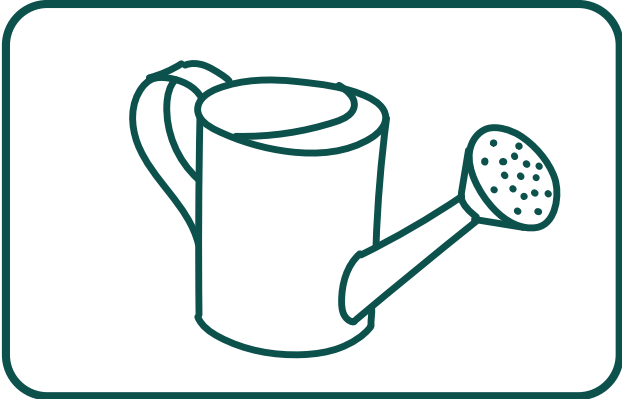
English Language Arts Common Core State Standards

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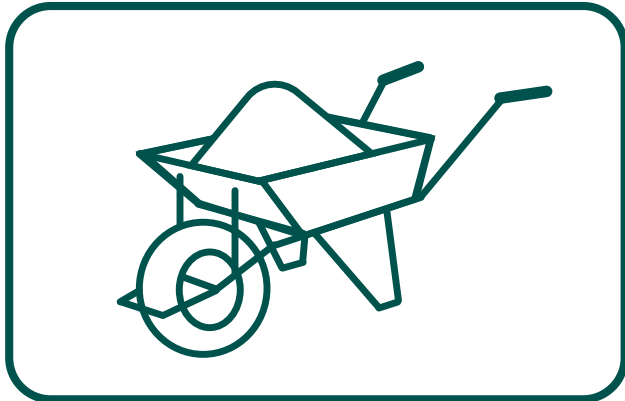
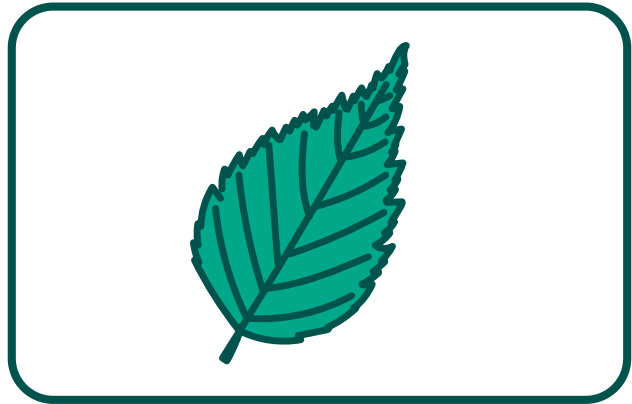
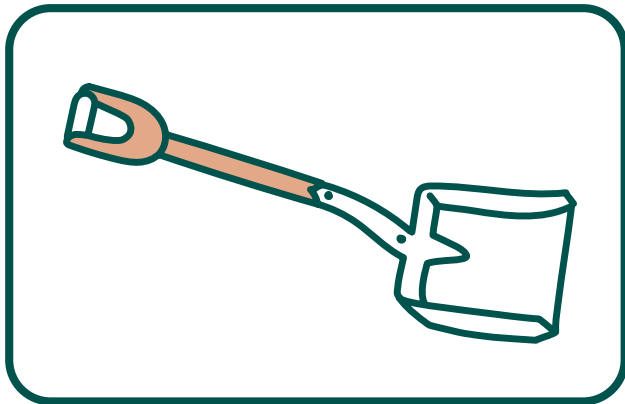
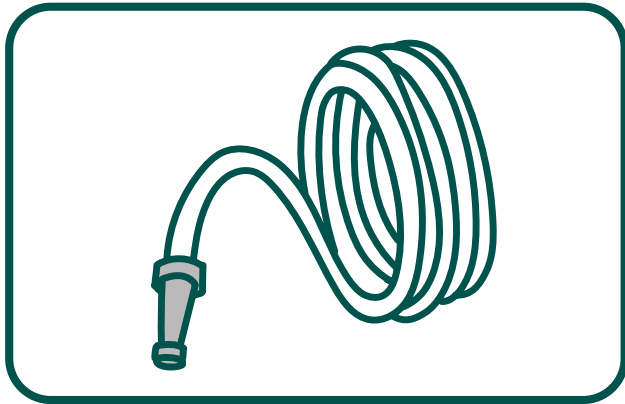
Follow agreed-upon rules for discussions (e.g., listening to others and taking turns speaking about the topics and texts under discussion).



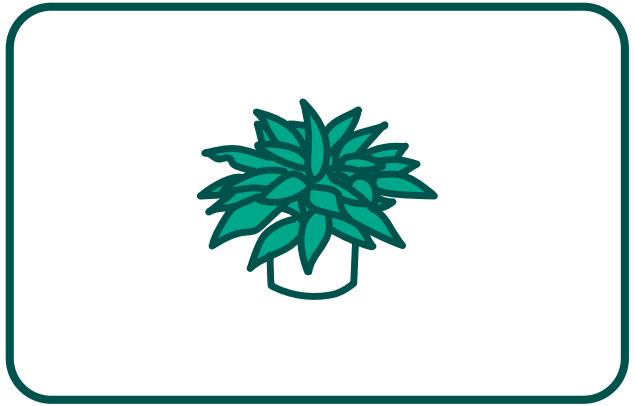
Garden Hunt Cards



Garden Hunt Cards

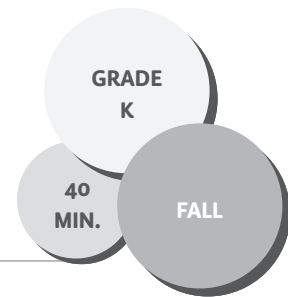


Garden Hunt Cards



Mindful Tasting

THEME: MAKING HEALTHY FOOD CHOICES



ESSENTIAL QUESTION

Why is it important to slow down and focus on our five senses while we eat?

LEARNING OBJECTIVE

✓ Students will be able to practice focusing on their senses while they eat.

LESSON DESCRIPTION

In this lesson, students learn the practice of slowing down and focusing on their senses while they're eating. They review the five senses, take an imaginary trip to an apple orchard, and end by mindfully eating two apple slices from two different varieties of apples.

MATERIALS

- 2 varieties of apples (or other fruit); enough for each student to have 1 slice of each
- Descriptive Sensory Word Bank Poster (optional)

PREPARATION

- › Cut each apple variety into 1 slice for each student, and put the apples on plates, ready to pass out.
- › Make a poster of the descriptive sensory word bank below:

SEE	TOUCH/ FEEL	SMELL	TASTE	HEAR
Red		Fresh	Juicy	Crunchy
Yellow	Smooth	Strong	Sweet	Crispy
Spotted	Rough	Dull	Sour	Quiet
	Bumpy	Stinky		
	Hard	Sweet		
	Soft			

ACTION STEPS

1. Engage: Have students gather in a circle, and ask them if they can name the five senses. As each student names one, gesture to each corresponding body part, making glasses around the eyes for sight and sticking your tongue out for taste. You can also point to each body part on your poster. Say, *These are our five senses. (5 min.)*

2. Sensory Field Trip: Tell students that you're going to take them on a field trip in their minds to practice thinking about the five senses. Walk them through a sensory trip to an apple orchard (or other field trip appropriate for your location), miming all the different actions that you describe. Have them experience riding the bus and feeling the bumps in the road, getting off the bus and smelling the farm, hearing the birds as you walk through the field, seeing the biggest, brightest apple in the tree, feeling their hearts beat as they climb up the tree, and tasting the apple at the end. Make it fun and physical by having students quietly run, climb, and jump in place. **(5 min.)**

3. Wash Hands Break! (5 min.)

4. Breathing Exercise: Use an attention-getting strategy to bring students back to sitting quietly. Have them close their eyes and do a deep breathing exercise to gain focus and calm bodies. They might enjoy doing horse lips on the exhale. Do this a couple times or until the group is relaxed. (5 min.)

5. Mindful Eating: Explain to students, *Slowing down while eating helps us enjoy our food better. I'll be giving each of you a slice of apple, but we're going to take a really, really long time to eat it because we're going to notice everything we can about the apple using our five senses. And we're not going to eat it until I say to. Now everybody, close your eyes.* Once all eyes are closed, hand an apple slice to each student:

Touch: Have students close their eyes and feel the apple with their fingers. Have them describe the texture of the skin and then the texture of the flesh. Ask them if it reminds them of something else they've touched.

Smell: With their eyes still closed, have students bring the apple to their noses and inhale. Ask them to describe the smell of the apple.

Hear: With their eyes closed, have them tap their fingernail on the skin and slide their fingertip along the skin and listen for any sounds.

See: Have students open their eyes and carefully examine the apple, describing the colors and shapes they see and any details they notice, for example bruises or mottled coloring.

Taste: Tell students to take one bite of their apple. Ask them to describe the taste and how the apple's taste changes as they continue chewing.

Hear: Have students use their ears again to listen to the sounds as they're munching on their apple. (10 min.)

6. Repeat entire sequence with a second variety of apple. (5 min.)

REFLECTION

Have students discuss the following questions in small groups, then share with the class: (5 min.)

- *What was the same, and what was different about the two apple varieties?*
- *Did you enjoy eating your apple slowly? What other foods could you try eating like this? What would it be like if we ate our breakfast or lunch like this?*
- *Why do you think it's important to slow down and focus on all the things you can feel, see, hear, smell, and taste about your food?*

ADAPTATIONS

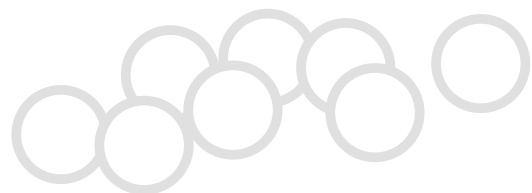
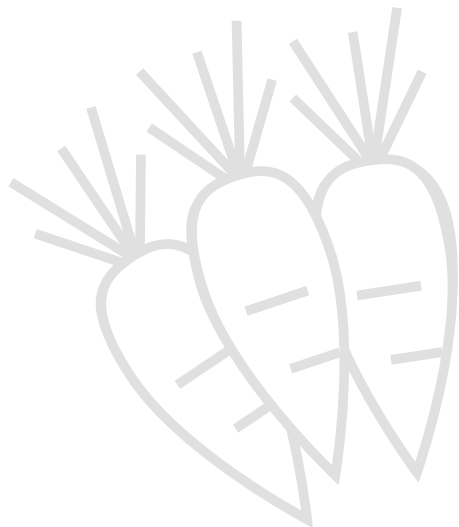
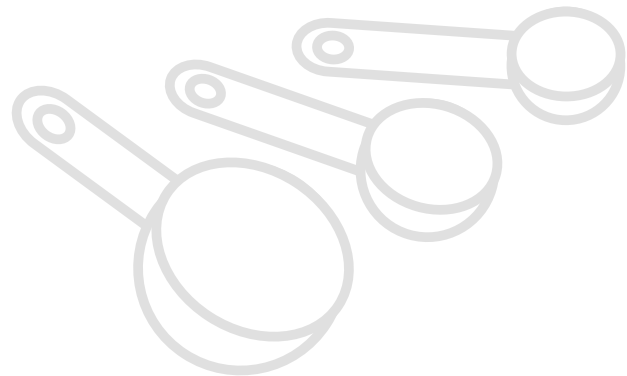
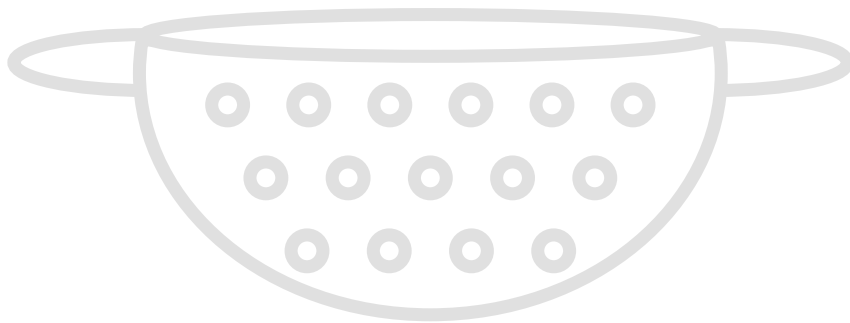
Garden Setting: You can lead students in mindfulness walks, noticing and describing the different smells, sounds, sights, and feel of the wind and the temperature. You can also try "sit spots" with older students, where each student finds a special quiet place to sit and observe the garden. They can make a "sound map" of their spot, noting every sound they hear while they're seated.

ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards

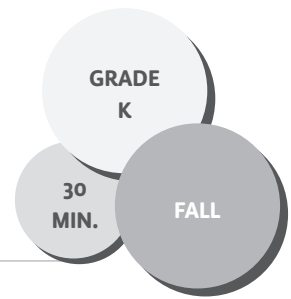
CCSS.ELA-LITERACY.SL.K.4

Describe familiar people, places, things, and events and, with prompting and support, provide additional detail.



Up, Up, Up We Grow!

THEME: EXPLORING THE ECOLOGY OF FOOD



ESSENTIAL QUESTION

How can we imagine what it feels like to be a plant?

LEARNING OBJECTIVE

✓ Students will be able to explain that a plant needs sun, soil, water, and air to grow.

LESSON DESCRIPTION

In this lesson, students play a guessing game, pretend to be a growing plant, and sing a song to consider what a plant needs to grow.

MATERIALS

- Fruit and Vegetable Picture Cards (pp. 57–61)
- Props to represent each plant need (optional)
- Flashlight or cardboard cutout to represent sun
- Brown or beige sheet to represent soil
- Watering can or cardboard cutout of a raindrop to represent water
- Blue yarn or scarf to represent wind

PREPARATION

- › Assemble or create your props.
- › Learn the “Sun, Soil, Water, Air” song by the Banana Slug String Band.

ACTION STEPS

1. Playing Who Am I Game: Gather students in a circle. Tell them that you’re a mystery object (a plant), and have them guess what you are.

Give students clues such as, *I really like the rain. I have lots of neighbors, but I don’t like to be too close to them. I cooperate with the bees! I get my food from the sun and air. My feet live in the ground.* Once they guess that you’re a plant, tell them that today you’ll be talking about what plants need to grow healthy and strong. Ask, *Have you or anyone you know ever had a plant? How did you care for it?* **(5 min.)**

2. Singing: Teach students the song, “Sun, Soil, Water, Air” by the Banana Slug String Band. Incorporate hand gestures or movements for sun, soil, water and air. If you have time, do a freeze dance to the song, stopping on different words each time. **(5 min.)**

3. Explain the Activity: First, ask students to name their favorite fruit or vegetable. Have the Fruit and Vegetable Picture Cards displayed to help generate ideas. Say, *We’re going to play a game where you each pretend that you’re a favorite fruit or vegetable seed, and you’ll use your bodies to show how you grow. Pretend I’m the gardener.* Before starting, have students check that they have space around themselves, and remind them to be careful of how they move so it doesn’t hurt others. Explain that seeds don’t like to be planted too close together either. **(5 min.)**

4. Role Play: Have students start as seeds, curled up on the ground. If using props, cover students' legs with the sheet, and tell them that you're planting them in the soil where they'll need to be nice and warm to sprout. Ask, *Seeds, what else do you need before you can sprout? (Water!)* Walk around and "water" each student's head with the watering can, and encourage them to sprout just a bit. Ask students again what they need. (Sun.) Say, *Yes, I hear that you make your very own food with energy from the sun, and carbon dioxide in the air helps, too!* Walk around, shining a flashlight on the students' arms (careful not to point it in their eyes) and waving your wind scarf or cutout. Encourage students to continue growing as you give them more water, sunshine, and air. Remind them that their feet are rooted in the soil, getting nutrients they need to grow strong. Once the students are starting to stand tall with their arms up high, ask them individually what type of plant they are, and if they have a fruit, root, or leaf you can harvest. If you have extra time, you can repeat this whole cycle at different speeds, such as a speed round, a slow-motion round, or the like. **(10 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *How are plants like us? How are they different from us?*
- *How can we take care of plants that we're growing?*
- *How did it feel to use our bodies to pretend we were plants? How did we make sure we were safe with our bodies?*

ADAPTATIONS

Age (Grades 3–5): If you have access to a field, try a game of Farmer Tag where there are a couple farmers who are it, trying to tag students to become seeds. Once a student is tagged by a Farmer, they crouch into a seed position. Then the student waves over the Water person (wearing a blue armband) and, after getting watered, sprouts one arm into the air. Then the student waves over the Sun person (wearing a yellow armband). Once the student has been tapped by both Sun and Water, the student stands with both arms up high, to show they're a fully grown plant, and the Farmer will come harvest them and bring them to the designated "farmer's market" (e.g., a soccer goalpost). Keep playing until the farmers and their sun and water helpers have all the students in the farmer's market or have a farmer's market jailbreak and switch roles.

ACADEMIC CONNECTIONS

Next Generation Science Standards, Life Science Disciplinary Core Idea

NGSS K-LS1-1

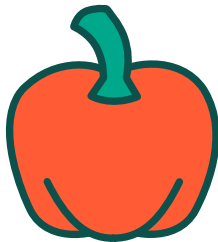
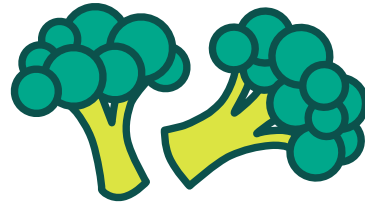
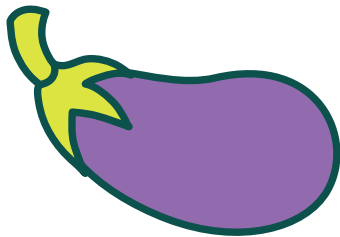
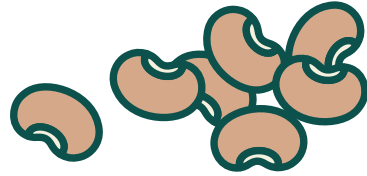
Use observations to describe patterns of what plants and animals (including humans) need to survive.

English Language Arts Common Core State Standards

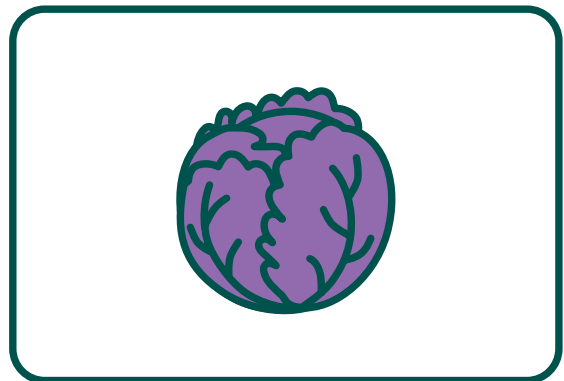
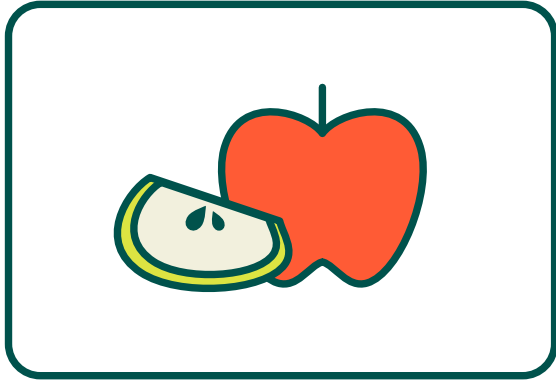
CCSS.ELA-LITERACY.SL.K.1

Participate in collaborative conversations with diverse partners about *kindergarten topics and texts* with peers and adults in small and larger groups

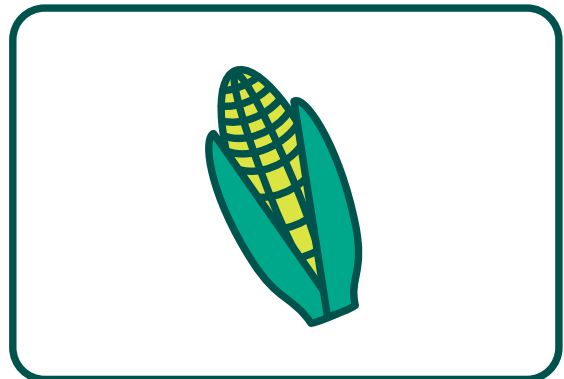
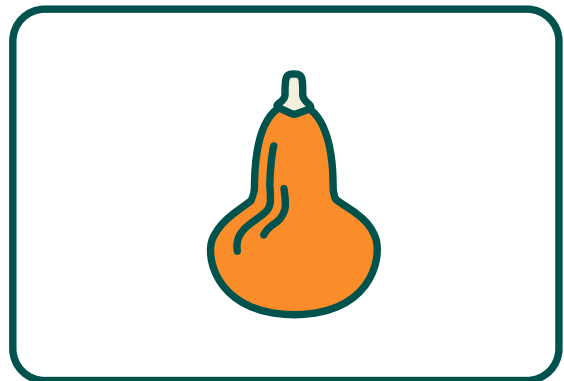
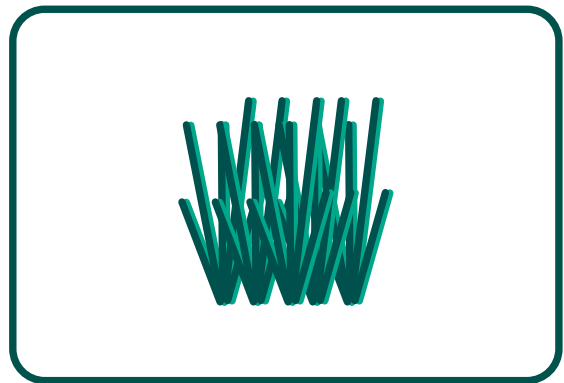
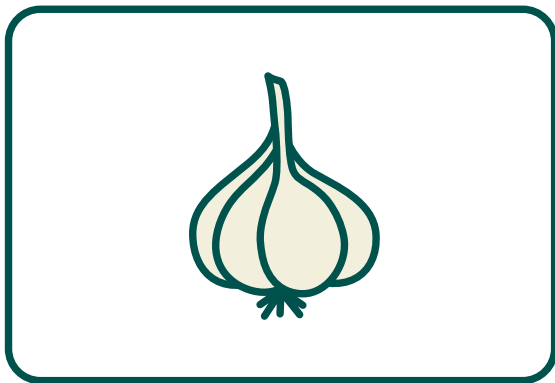
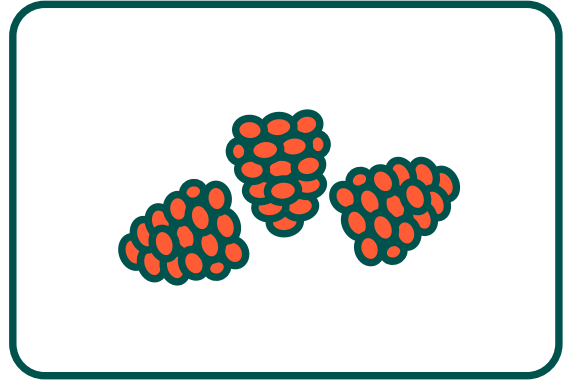
Fruit and Vegetable Picture Cards



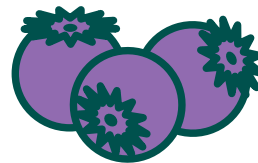
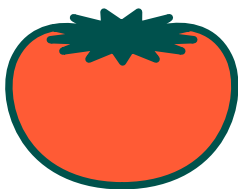
Fruit and Vegetable Picture Cards



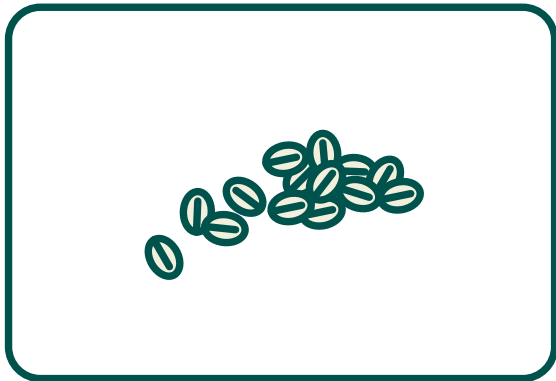
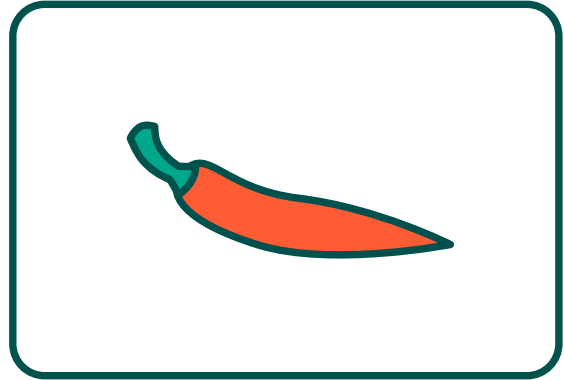
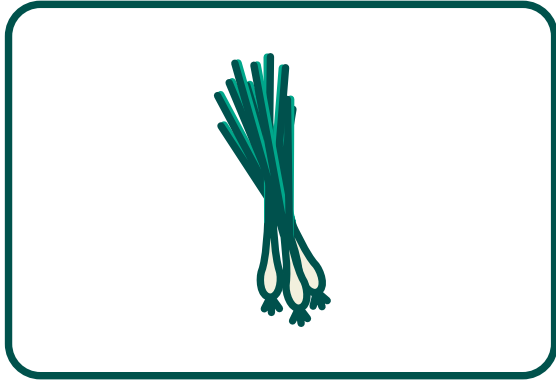
Fruit and Vegetable Picture Cards



Fruit and Vegetable Picture Cards

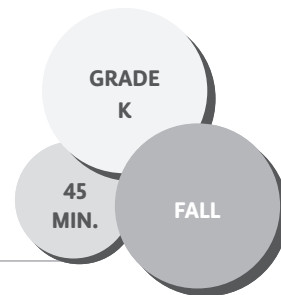


Fruit and Vegetable Picture Cards



Let Us Grow Lettuce!

THEME: GROWING AND ACCESSING HEALTHY FOOD



ESSENTIAL QUESTION

How can we give plants everything they need to live and grow?

LEARNING OBJECTIVES

- ✓ Students will be able to explain what a plant needs to grow.
- ✓ Students will be able to sow seeds.

LESSON DESCRIPTION

Students review what a plant needs to grow and then broadcast and water lettuce seeds in a prepared garden bed.

MATERIALS

- Approximately 1 cup of nursery-grade sand (available at garden centers)
- 1 2-gallon bucket or other container
- 3–4 packets of lettuce seeds, appropriate for your climate; loose-leaf varieties work best for broadcasting the seeds
- 1 large head of lettuce
- 5 watering cans or large bucket and recycled quart-sized yogurt containers

PREPARATION

- › In your bucket or other container, mix lettuce seeds with sand, reserving enough seeds for each student to have one to observe.
- › Prepare the garden bed where students will broadcast the seeds.

- › Fill watering cans to be ready for students to share. You can make your own watering cans by collecting clean, empty, quart-sized yogurt containers and poking or drilling several holes in the bottom.
- › Learn “Sun, Soil, Water, Air” by the Banana Slug String Band.

ACTION STEPS

1. Discussing: Gather students in a circle. Give each student one of the reserved lettuce seeds. Ask them to close their eyes and squeeze their seeds until you tell them it’s time to open their eyes. While their eyes are closed, place a head of lettuce in the center of the circle. Now tell them they can open their eyes to see what their seeds can make! Ask students what they think a plant needs to grow from a seed into a full-grown, food-producing plant. Consider singing “Sun, Soil, Water, Air” by the Banana Slug String Band to help them remember. Explain, *Today we’re going to plant seeds outside, and we’ll have to make sure we give our seeds all the things they need.* Pass around a couple of lettuce seeds to show students how small they are. **(5 min.)**

2. Hunting or Tasting in Garden: Move to the garden if you’re not already there. Gather students and ask, *Do we already have plants in our garden that are ready to eat? We’re going to go on a hunt for something that we think is ready.* Remind students of expectations, including

having permission before they pick. You can facilitate the hunt as a game such as hot and cold, or let students freely explore. If you don't have any crops currently growing in your school garden, divide your head of lettuce, and have a simple tasting where each student eats a leaf. This will help build anticipation for the lettuce they'll be planting. Tell students, *Leaves take in nutrients from the soil and energy from the sun. Nutrients help us to be healthy and energy helps us be able to do things. This means that, when we eat leaves, we are getting nutrients and energy to make us glow with health!* Have students look down and thank the soil, and look up and thank the sun (being careful not to look directly at it). **(10 min.)**

3. Demonstrate Sowing Seeds: Show students that you've mixed the tiny lettuce seeds with sand. Demonstrate taking just a handful and sprinkling it over a patch of the garden bed. Say, *Watch how I spread the seeds gently. And I'm looking to see where my friends are, so I'm not getting any on them.* Ask students to place one of hands on their hip. Explain that one way to know they're being careful when they sprinkle their seeds is to make sure their hand doesn't go higher than their hip. Then show students how you water your seeds. **(5 min.)**

4. Planting Lettuce Bed: Have each student take a handful of the seed/sand mixture and stand around the garden bed. You can have two students at a time sprinkle their seeds, or have a countdown where the group does it all together. Then let students use watering cans to water their seeds. **(10 min.)**

5. Drawing: In the garden or in the classroom, have students draw a picture of the lettuce bed

they just created. Ask them to include all the things the plant needs to grow. They may also include themselves and their family eating lettuce. Alternatively, you can provide students with wide plant tags and have them draw something the plants need, such as a water drop or some sunshine, on each one. Have them stick their tags in the garden bed next to their seeds. **(10 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *What's growing in our garden right now?*
- *What will our plants need to grow?*
- *How did we practice being safe in the garden today?*

ADAPTATIONS

Follow-Up: Bring students out to the garden to thin the lettuce bed by having pairs of students harvest small plants. You can then prepare a simple salad with the harvested greens and a homemade vinaigrette.

Simple Kid-Friendly Dressing

- 3 parts olive oil
- 1 part rice vinegar
- 1 Tbsp honey
- Salt to taste

ACADEMIC CONNECTIONS

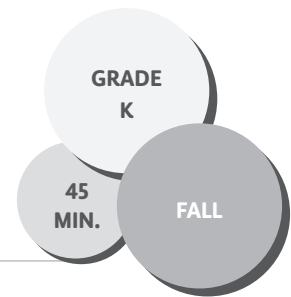
Next Generation Science Standards

NGSS K.LS1.C.

All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow.

Veggie Wraps

THEME: PREPARING HEALTHY FOOD



ESSENTIAL QUESTION

How can we use vegetables to make a healthy snack?

LEARNING OBJECTIVE

✓ Students will be able to combine ingredients to make a healthy snack.

LESSON DESCRIPTION

In this lesson, students listen to a read-aloud about the wonderful variety of vegetables, and they share ingredients to create veggie wraps with hummus.

MATERIALS

- *Rah, Rah, Radishes!* by April Pulley Sayre
- 3–4 vegetables students may not be familiar with to “show and tell”
- Tray with the following for each group of 4–6 students:**
 - Whole wheat or rice flour tortillas (one for each student)
 - 3 or more bowls, each filled with a different chopped or grated vegetable, such as cauliflower, bell peppers, cucumbers, cherry tomatoes, romaine lettuce, shredded beet or carrot, or whatever is available and in season
 - Pair of mini tongs for each bowl
 - 1 tub or bowl of hummus, enough for approximately 1 Tbsp for each student
 - 1–2 plastic knives
- 1 whole, intact sample of each of the vegetables for demonstration
- Plate for each student
- Materials for cleanup

PREPARATION

- › Cut up several types of vegetables, differing in color and texture, for students to place in their veggie wraps.
- › Prepare trays for each group as well as a tray of the whole vegetables.

ACTION STEPS

1. Discussing: Gather students in a circle and ask, *What is a vegetable?* Then ask students to name as many vegetables as they can. Pass around several different vegetables (that students may not be familiar with) to feel and observe. Explain to students that you’re going to be making a snack using different vegetables. **(5 min.)**

2. Reading: Read a book about a variety of vegetables, such as *Rah, Rah, Radishes!* by April Pulley Sayre. As you’re reading, ask students to raise a quiet hand when they hear the name of a vegetable they’ve eaten and to put their hand on their head when they hear about a vegetable for the first time. While you’re still in a circle, show students each of the vegetables you brought for the tasting, and see if they can identify them. Pass them around the circle, allowing students to touch and smell them, but instructing them to be gentle and not to taste them. **(10 min.)**

3. Demonstrate Making a Veggie Wrap:

Model the process of making a veggie wrap. If the classroom has a document camera, it can be helpful to project your actions on the screen. First spread some hummus on the wrap, showing students you only need a little. Share that hummus is a flavorful dip made primarily from beans. Then demonstrate adding only one or two pieces of each veggie on top and rolling it up. Emphasize sharing and only taking a small amount so there's enough to go around. **(5 min.)**



4. Wash Hands Break! This is a good time to distribute trays to table groups. **(5 min.)**

5. Making Veggie Wraps: Have students return to their tables and instruct them to place one tortilla on their plate. Circulate through the room, providing support to those who need it and guiding students to share and pass the tongs to their neighbors. **(10 min.)**

6. Tasting: Have students wait until everyone has created their veggie wraps before tasting. **(5 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: (5 min.)

- *How would you describe the taste of your veggie wrap?*
- *What were the names of the vegetables we put into our veggie wraps?*
- *What were the colors of the vegetables we put into our veggie wraps?*
- *What else would taste good in our veggie wraps? (You might consider raw and cooked vegetables, other dips, etc.)*
- *Who would you like to make this snack for and why?*

ADAPTATIONS

Extension: Have students create a visual recipe by drawing all the ingredients they put in their veggie wrap inside a circle to represent the tortilla.

ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.SL.K.1.A

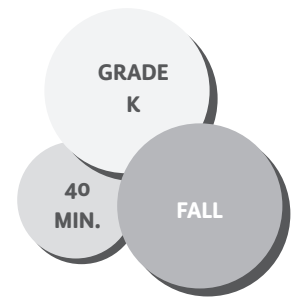
Follow agreed-upon rules for discussions (e.g., listening to others and taking turns speaking about the topics and texts under discussion).

CCSS.ELA-LITERACY.SL.K.6

Speak audibly and express thoughts, feelings, and ideas clearly.

Fabulous Five: What a Plant Needs to Thrive

THEME: GROWING AND ACCESSING HEALTHY FOOD



Adapted with permission from Shelburne Farms' Cultivating Joy and Wonder

ESSENTIAL QUESTION

What does a plant need to grow?

LEARNING OBJECTIVES

- ✓ Students will be able to explain what a plant needs to grow.
- ✓ Students will be able to plant a seed.

LESSON DESCRIPTION

In this lesson, students go on a mystery journey, following clues around the garden while learning what plants need, before planting their own seeds.

MATERIALS

- Letter envelope
- Bag of beads for each station (1 bead for each student)
 - Yellow for Sun
 - Blue for Water
 - Clear for Air
 - Green for Space
 - Brown for Soil
- 1 For each student
 - Pipe cleaner
 - Popsicle stick
 - Bean seed
- 5 signs and stakes representing each clue station
 - Picture of a sun
 - Picture of a watering can with drops of water
 - Picture of a gust of wind (with a pinwheel attached to the top)
 - Picture of a plant with arrows pointing away from it for space

- Picture of a pile of rich, brown soil
- Pinwheel, make your own or purchase
- 10–15 ½ quart containers or plant pots (for carrying finished compost to garden bed)
- Finished compost (bagged or from garden)

PREPARATION

- › Prepare clue stakes, laminating and stapling pictures to the stakes. Tape the bag of corresponding beads to each stake as well.
- › Set up locations for each clue in the scavenger hunt.
 - › For the sun station, choose the sunniest spot in the garden or a place where sunflowers are planted.
 - › Make the water station at a garden bed in need of water. Fill watering cans for students to use at this station.
 - › The air station can be in a wide open space in your garden where students will have plenty of room to do jumping jacks.
 - › Make the space station a couple garden beds where students can plant their seeds. Use popsicle sticks to indicate how far apart your seeds should be spaced from each other.
 - › The soil station can be at your compost pile if you have one.
- › Place bean seeds into an envelope with the first clue.

ACTION STEPS

1. Seeds and Clue 1: Gather students in a circle and say, *My friend is a farmer, and she gave me this special packet of bean seeds. She told me to share them with a special group of kids, but I'm not sure what I'm supposed to do with them.* Pass out the seeds to each student, and when your envelope is empty pretend to theatrically discover the first clue, saying, *Wait! There's a message here.* Read aloud the first clue and ask students, *Where do you think our seeds want to go?* (Somewhere sunny!) **(5 min.)**

2. Sun and Clue 2: Guide students to the next clue, letting them mostly lead the way. Once you find the sun stake, have students take a moment to bask in the sun with their eyes closed, saying, *Let's warm up our seeds and ourselves.* You might ask students to take a couple breaths in and out to savor the sunny moment (if it's a sunny day!). Then have the classroom teacher or volunteer pass out a pipe cleaner and yellow bead to each student, and explain that this represents the sun, while you read the next clue. Ask students, *What are our seeds telling us they need in addition to sun?* (water) **(5 min.)**

3. Water and Clue 3: Have students lead you to the water stake and say, *Now that we know plants need water, let's help these plants by watering them.* Have students take turns with watering cans, watering a garden bed close to the water stake. Meanwhile, pass out blue beads to represent water. Once everyone has had a turn, read aloud the third clue, pausing to allow students to fill in the blank by saying "air." **(5 min.)**

4. Air and Clue 4: Once at the air station, say, *When I say "go!" we're going to do ten jumping jacks. Ready? Go!* Ask students how they feel, and point out, *When our bodies work hard, we breathe deeper because we need air, just like our seeds do.* Pass out clear beads, and read the next clue, again allowing students to fill in the blank by saying "space." **(5 min.)**

5. Space and Clue 5: Once students find the space station, explain that you think this is where the seeds are ready to be planted! Ask students to put their arms out to show how much space they like around their body, and explain that plants need their space too. Show students with your hands how far apart their seeds should be spaced from each other, and explain how they should pull out a popsicle stick and plant their seed in its place to make sure it has enough space. Show students how deep they should plant their seed using your finger and ask them all to point to the depth on their finger as well. Tell students to place seeds more shallow than their normal depth to account for the compost students will add to the bed. As students finish planting their seeds, pass out the green bead and then read aloud the final clue. **(5 min.)**

6. Soil: At the soil station, show students how to take a scoop of compost and explain that they'll bring this back to where they planted their seed. If you have a thriving compost system, take time to show students some interesting features before completing the task. **(5 min.)**

7. Nurturing Our Seeds: Back at the space station, demonstrate how to gently sprinkle the compost over the garden bed, and gently pat down the soil. Then have students water

their seeds. Ask, *Have we given our seeds all they said they needed? Let's see.* Go through a checklist of all the needs, asking students to determine whether their seed has them. **(5 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *What are the things you need to grow? How are they the same and different from plants?*
- *How did it feel to plant a seed and give it what it needs?*

ADAPTATIONS

Dress Up a Plant Variation: As a way to engage students at the beginning of the lesson, play Dress Up a Plant, as described in FoodCorps lesson “Plant Part Mystery,” where you or the classroom teacher are dressed up by the students to resemble a plant. Have a bag of props and costume material for them to choose from to ensure the plant has roots, a stem, leaves, flowers, etc. Then once the plant is fully dressed, have them theatrically drop the first clue and say, *The plant is giving us a message!* Then continue with the hunt.

ACADEMIC CONNECTIONS

Next Generation Science Standards, Life Science Disciplinary Core Idea

NGSS LS1.C

Organization for Matter and Energy Flow in Organisms

All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow. (K-LS1-1)



Seed

Clue 1

In order for me to grow big and strong,
You are going to need to help me along.

Five things I need to stay alive—

We'll call them the **fabulous five!**

The first will surely help me wake.

It's cold in here for goodness sake!

I must warm up and feel the light—

Take me where it's warm and bright.

Sun

Clue 2

I'm much warmer now, thanks a bunch,
But I think it's getting time to munch.
I make my own food whenever I'm hungry,
But the problem is, I'm really *thirsty!*

Look around—you need to think,
and find something for plants to drink.

Water

Clue 3

You need me, and I need you!
Soon you'll learn a step or two.
We eat and drink and need to share,
'Cause both of us must breathe the

_____.

Look around—think and observe.
Can you see where wind is pushing air?

Air

Clue 4

Even though I'm little now,
I'll soon enough be big—somehow.
I'll grow with others (it's not a race).
Just don't plant me too close,
I need my _____.

Look around! You'll see a sign,
showing plants with room, growing fine.

Space

Clue 5

Sun, water, air, and space—
Are things I need to grow.

But there's one more thing I need, you know.

It's dark and brown, under your feet,
Without it my life will be incomplete.

Look for the place where worms can dwell,

Complete the Fab Five
and your plants will grow well.

Soil

The Fab 5!

Sun

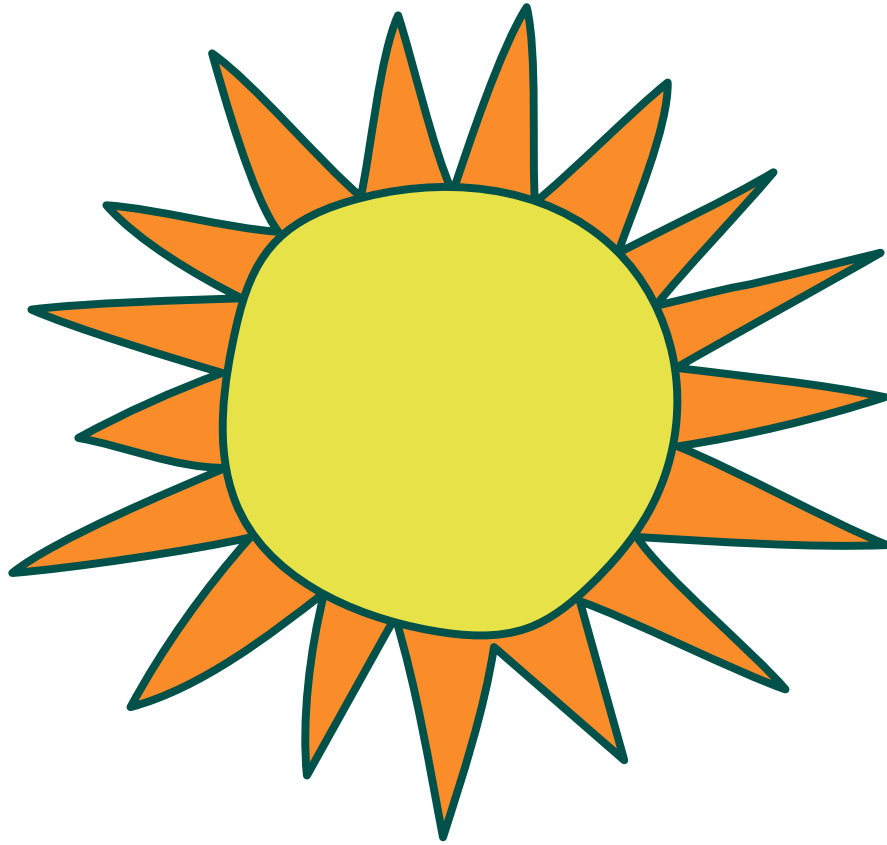
Water

Air

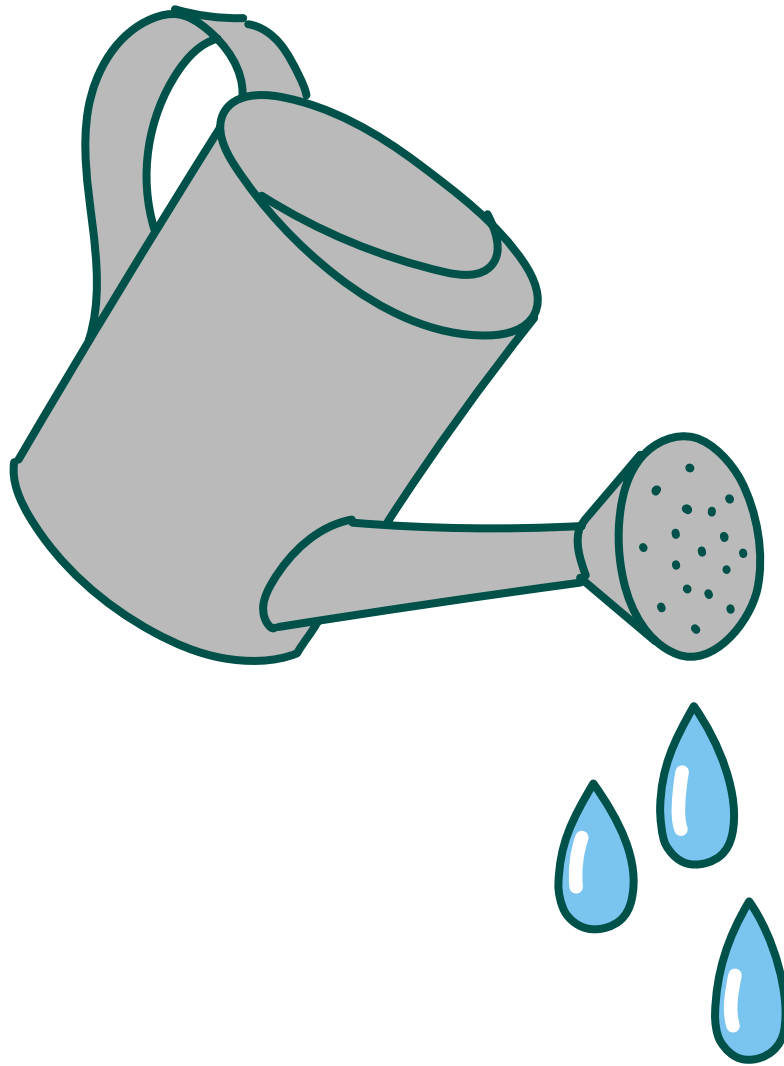
Space

Soil

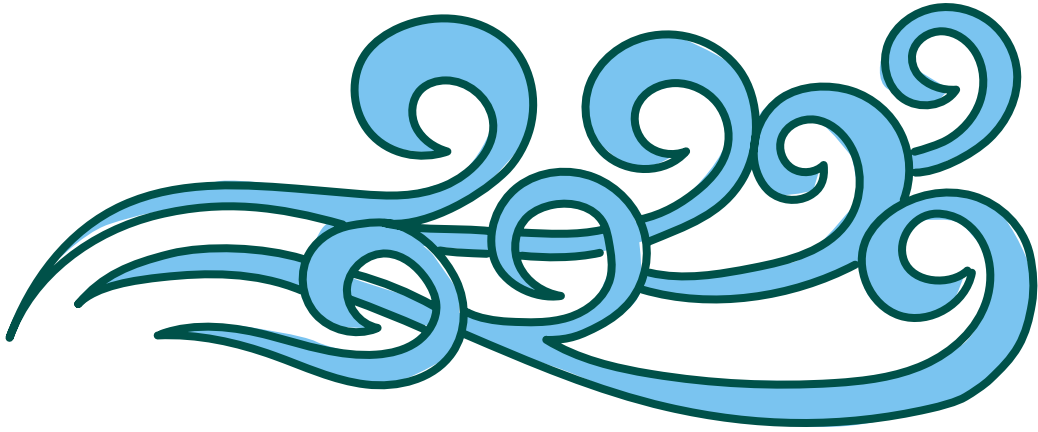
Plant your seeds!



SUN



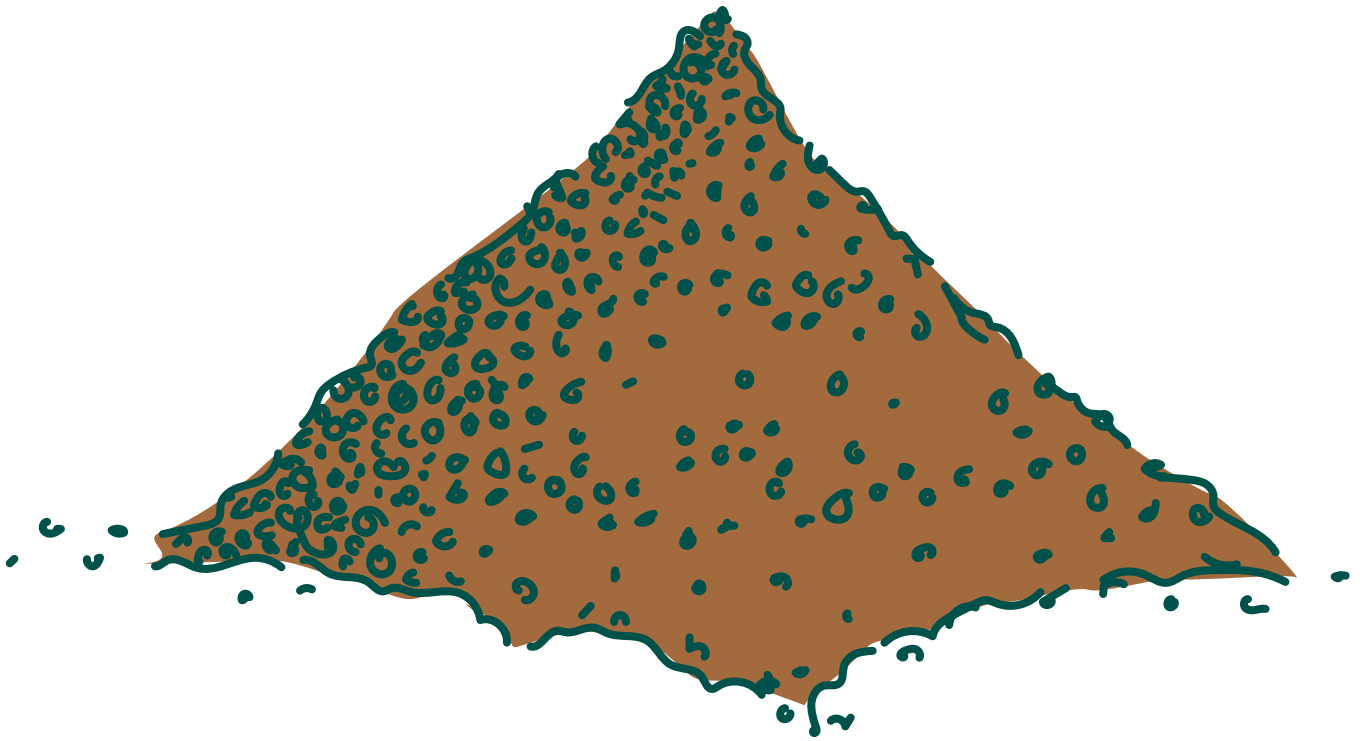
WATER



AIR



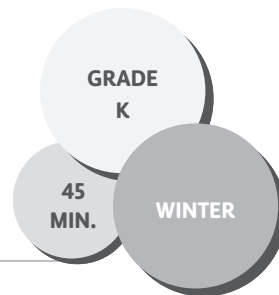
SPACE



SOIL

Rainbow Smoothie

THEME: MAKING HEALTHY FOOD CHOICES



ESSENTIAL QUESTION

How can we create a healthy snack using lots of fruits and vegetables?

LEARNING OBJECTIVES

- ✓ Students will be able to identify the colors of fruits and vegetables.
- ✓ Students will be able to prepare a healthy snack.

LESSON DESCRIPTION

In this lesson, students play a memory game to become familiar with the colorful ingredients for a smoothie the class will make and enjoy together.

MATERIALS

- Blanket
- Ingredients from Rainbow Smoothie Formula
- Small cups for each student
- Blender
- Extension cord

Tray of the following for each group of 4–6 students:

- Kale leaf for each student (or other ingredient for students to process)
- Flexible cutting mats
- Empty bowl for processed ingredients
- Empty bowl for compost
- Rainbow Smoothie Worksheet (p. 83)
- Crayons
- Materials for cleanup

Rainbow Smoothie Formula

- 1 cup liquid (water, juice, almond milk, soy milk, etc.)
- 1 cup yogurt (full-fat vanilla)
- 1 cup berries (fresh or frozen)
- 1 cup fruit
- 1 banana (fresh or frozen)
- ½ cup leafy greens (kale, collards, chard, or spinach, etc.)

PREPARATION

- › Prepare a tray of the whole fruits and vegetables that will be going into your smoothie to show to students.
- › Select one or two ingredients for your smoothie that kindergartners can lend a hand in preparing (e.g., kale that can be torn into small pieces, strawberries that can be destemmed, bananas or clementines that can be peeled, etc.). Prepare a tray with some of each ingredient students will prepare for each small group.
- › Set up a station with your blender and other ingredients close to a power outlet where all students can see you.
- › Photocopy the Rainbow Smoothie worksheet for all students.

ACTION STEPS

1. Memory Game: Gather students seated in a circle with your covered tray of sample ingredients in the center. Say, *Underneath this blanket I have all the ingredients we're going to put into a smoothie we'll be making today. But first, we're going to play a memory game. On the count of three, I'll take away my blanket and show you what I brought, but it's going to be very quick, so you'll have to pay close attention.* Lift the blanket and then replace it over the fruit. Have students turn and share with their neighbor all that they remember seeing under the blanket, then discuss it as a class. Encourage students to describe the ingredients they don't know the names of. Then reveal the ingredients once more, and go over the name of each. You can continue playing the memory game by having students close their eyes while you remove one of the ingredients. Then have them see if they can recall which is missing. Explain, *We're adding all these colors to the smoothie because having all the colors makes the smoothie care for all parts of our body.* **(10 min.)**

2. Color Dance: With all the ingredients on display, ask students questions such as *What's the color of the long leaf we're going to put into our smoothie?* After they give the answer (e.g., green), say, *Any student who is wearing a green shirt stand up and do a dance until I say, "Stop."* Continue until you've gone through all the colors present. End by saying, *Now everyone who didn't get a chance yet, stand up and do a three-second dance!* **(5 min.)**

3. Wash Hands Break! (5 min.)

4. Model Ingredient Prep: Explain to students that having fruits and vegetables that are all the different colors of the rainbow is healthy. Show students

how they should prepare the ingredient you'll be passing out to each small group. For example, show students how you take the kale leaf off its stem, tear the leaf into small pieces, put the pieces in the group bowl, and finally, how you put the stem into your compost bowl. Remind students to keep their hands clean as they work. **(5 min.)**

5. Making the Smoothie: Pass out ingredients to each table group. Have the classroom teacher circulate through the room, and provide support in helping students share. Meanwhile, add the other ingredients to the blender. Then call one student from each group to come up and add the prepared ingredient. Have the student add the ingredient in increments so each student in the group gets a chance. Once students have contributed to preparing the ingredients, and their table is cleaned up, pass out the Rainbow Smoothie Worksheet where students will draw fruits for the different colors of the rainbow. **(10 min.)**

6. Tasting: Portion the smoothie into small cups for each student and distribute. Remind students to wait until each student has one before tasting. Enjoy together! **(5 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *How does your smoothie taste? What words can you use to describe it? What color is it? Look for opportunities to expand their vocabulary, such as by saying, *Is it smooth? Gritty? Sour? Sweet? Tangy?* etc.*
- *Why do you think it's important to eat fruits and vegetables that are lots of different colors?*

ADAPTATIONS

Extension: Create large dice with different colors on each side of the cube. Have students take turns rolling, and when the die lands on a particular color, challenge them to name all the fruits and veggies they can of that color.

ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.SL.K.4


Describe familiar people, places, things, and events and, with prompting and support, provide additional detail.



Name: _____ Date: _____

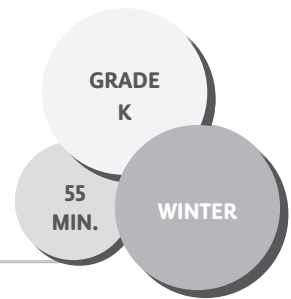
Rainbow Smoothie Worksheet

Draw a picture of a fruit or vegetable for each color.

RED	
ORANGE	
YELLOW/WHITE	
GREEN	
BLUE	
PURPLE	

Who Eats What?

THEME: EXPLORING THE ECOLOGY OF FOOD



ESSENTIAL QUESTIONS

Where does our food come from?

How are animals alike and different?

LEARNING OBJECTIVES

✓ Students will be able to explain that their food comes from plants and animals.

✓ Students will be able to discuss how eating a wide variety of foods from plants and animals keeps them healthy.

LESSON DESCRIPTION

In this lesson, to gain a better understanding that all living things need food to grow, and food comes from plants and animals, students will listen to a read-aloud and create their own book matching animals to what they eat.

MATERIALS

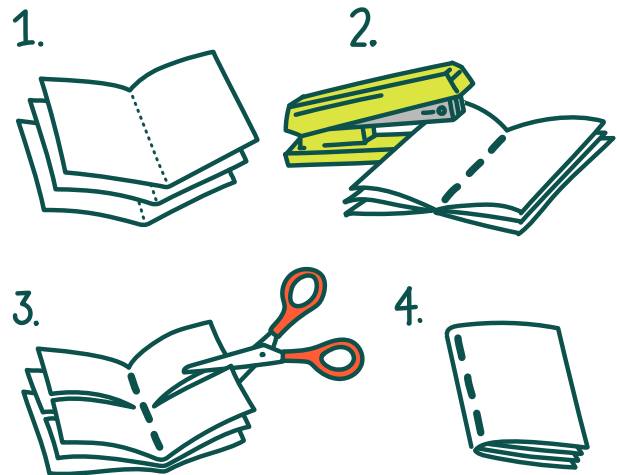
- *My Very First Book of Food* by Eric Carle
- Who Eats What? Matching Cards (pp. 86–87)
- A crop or picture of a crop with evidence of insects eating it, such as a chard leaf with holes in it
- Glue sticks
- Scissors
- Paper

PREPARATION

- › Create folded mini books for students to glue pictures into. Fold three pieces of paper in half and staple on the centerline. Cut the

two inner pages in half, so the pages are split, leaving the outer page as the cover.

- › Make a completed mini book with the Who Eats What? Matching Cards pasted into the book as a model for students.



ACTION STEPS

1. Observing: Gather students in a circle and tell students, *It's time to put on your detective caps because I have a mystery for you to solve. How did the holes get in these chard leaves I've been growing?* Pass around your chard leaf or other nibbled crop, and ask students to look at it carefully. Field guesses from students, and get to the idea that an insect, or maybe even a larger animal, must have been eating it. Help them see the connection between the animals in our garden

and humans by saying something like, *Hmm. So the plant that I've been growing to eat as food, insects like to eat as food too!* **(5 min.)**

2. Reading: Explain that you're going to read a book about what different animals eat. Read *My Very First Book of Food* by Eric Carle. After reading, ask, *Which animals eat plants? Which animals eat other animals? Are humans plants? (No). How are we different from plants? Are humans animals? (Yes!)* Go around the circle and have students share something they eat. You might even have them say, "I'm an animal, and I eat ____!" **(10 min.)**

3. Sorting Foods: Demonstrate for students how to cut out the Who Eats What? Matching Cards, and match a pair or two together as a class based on which living being eats what for food. If you have a document camera and screen, you might use it here. Have students return to their desks. Pass out the matching card sheets and scissors for students to cut out and match. Circulate through the room, supporting students and asking probing questions if you see they've mismatched cards. **(10 min.)**

4. Making Books: Pass out mini books and glue sticks to each student. Show students your completed book and how you neatly pasted the animal on the top half and what it likes to eat on the bottom half. Then show students the page that says "Me," and show them how you drew a picture of yourself, and below you drew your favorite food. Encourage students to color their pictures once they're finished gluing the images. Explain that to be healthy humans need more than one food; they need lots of different foods from plants

and animals every day. Ask students, *What are some foods from plants and animals that you like to eat?* **(15 min.)**

5. Reading with Partners: Once students clean up their tables, have them find a place in the room to partner read their new books. **(10 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *What do we like to eat that a ____ likes to eat?*
- *What does a ____ eat that we usually don't eat?*
- *How did you figure out what had been eating our plant?*
- *Where does our food come from?*
- *Why do you think it's important that we eat so many different foods?*

ADAPTATIONS

Garden: After passing around the leaf with the evidence of insect bites, have students work in pairs to go outside and find the leaf and potentially the culprit! Hunt for other evidence of animals eating plants for food. Find the plants in the garden that humans eat for food. Extension: Read *Trout are Made of Trees* by April Pulley Sayre to explore the ideas of food chains and the interconnectedness of different animals.

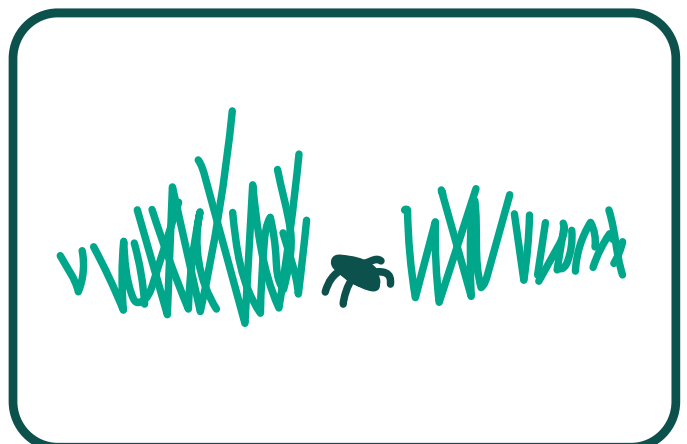
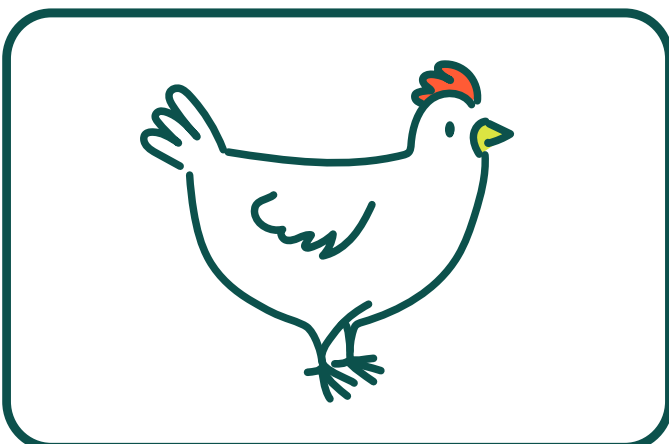
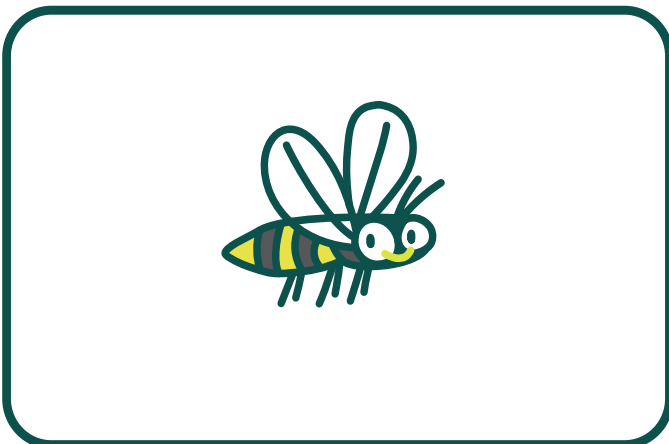
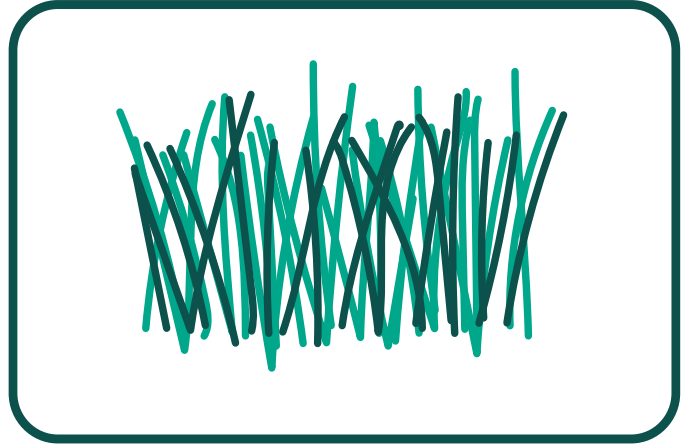
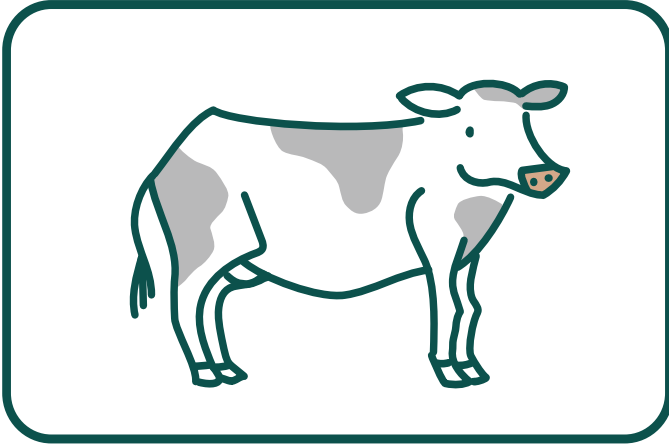
ACADEMIC CONNECTIONS

Next Generation Science Standards
Life Science Disciplinary Core Idea

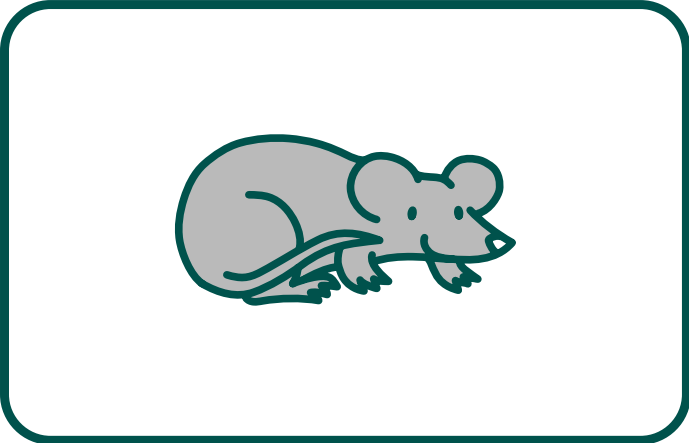
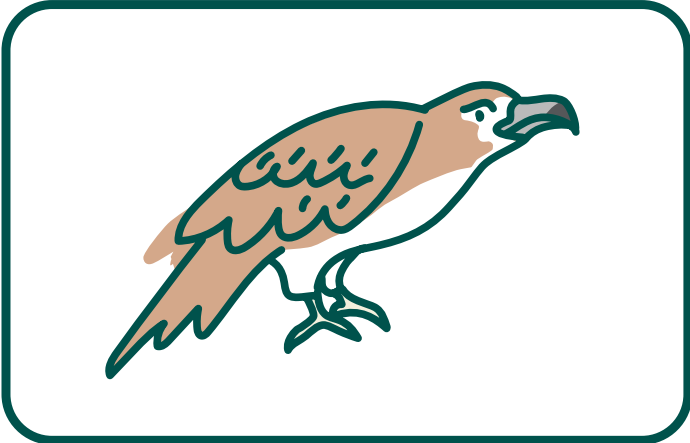
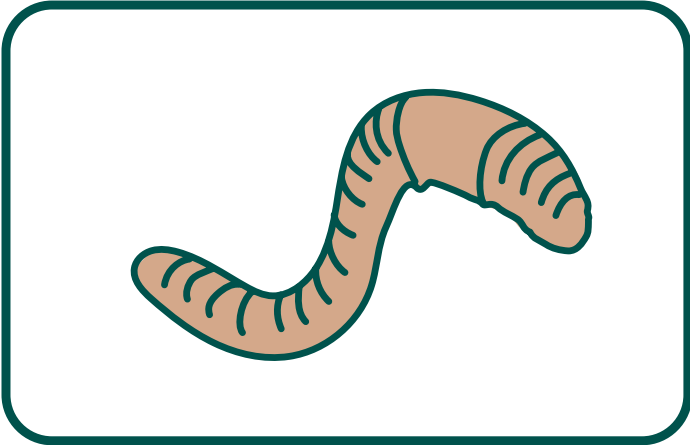
NGSS K.LS.1.C

All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow.

Who Eats What? Matching Cards



Who Eats What? Matching Cards

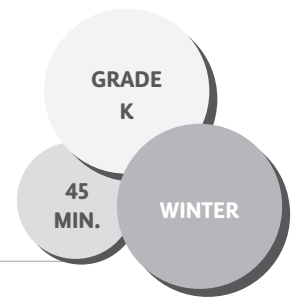


ME ↗

WHAT I EAT ↗

Bean Buddies

THEME: GROWING AND ACCESSING HEALTHY FOOD



ESSENTIAL QUESTION

How do we make a seed sprout?

LEARNING OBJECTIVES

- ✓ Students will be able to identify what a plant needs to grow and thrive.
- ✓ Students will be able to prepare a seedling and make predictions about its growth.

LESSON DESCRIPTION

In this lesson, students learn about the optimal conditions for a bean seed to germinate by listening to a story and then making Bean Buddies in zip lock bags. Students draw pictures and make predictions about their seed's growth.

MATERIALS

For each student:

- Bean seeds
- Zip lock bags
- Paper towels
- Observation Log (p. 90)
- Permanent marker
- 2 Spray bottles
- Crayons
- Paper and pencils
- *One Bean* by Anne Rockwell

PREPARATION

- › Soak beans overnight for better germination.
- › Photocopy the Observation Log for each student.

- › Make your own bean buddy beforehand to troubleshoot any issues and have a model to show students.

ACTION STEPS

1. Engage: Gather students in a circle, and explain that today they'll be learning more about what plants need to grow by sprouting their very own seed. Ask, *How many people have planted a seed before?* Discuss students' prior experiences growing plants. **(5 min.)**

2. Reading: Read *One Bean*, which tells the story of a young boy soaking and sprouting a bean as the students will do. Alternatively, for a more whimsical approach, tell students the story of Jack and the Beanstalk. Explain that you'll be giving them magical bean seeds today as well. Have them close their eyes and imagine climbing the beanstalk that'll grow from their seeds. Ask, *What place will your beanstalk take you to?* **(5 min.)**

3. Making Bean Buddies: Say, *Now we're going to make friends with a bean!* Show students your model Bean Buddy. Encourage students to help each other while making their Bean Buddies. Pass out paper towels to each student and a couple spray bottles to share. You may want to predetermine the number of spritzes that will adequately dampen the towel, and tell students to only use that many. Then pass out one seed to each student, and have students

fold their paper towel behind the bean. Finally, pass out zip lock bags, and have students place their bean inside. **(10 min.)**

4. Discussing Plant Life Cycle: Have students recall a plant's life cycle. Ask, *Which part of the plant is the bean? Which part of the plant do you expect to grow out of the seed first? What do you think will grow next?* **(5 min.)**

5. Drawing: Pass out crayons, paper, and pencils for students to draw pictures of their seeds and how they think their seeds will look in one week. This is a good time to have students use a permanent marker to write their name on the zip lock bag and their drawing. Have students clean up and collect their Bean Buddies, explaining that you'll tape them to the window to help them sprout, and that's where they'll check on them every day. **(10 min.)**

6. Sharing: Return to the circle, and have students share their drawings with a partner. **(5 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *What do seeds need to grow into plants?*
- *How long do you think it will take until we see the bean sprout? How big do you think its leaves will get?*
- *Why doesn't the bean seed need soil to sprout? Do you think it'll need to be in soil soon?*

ADAPTATIONS

Follow-up: Have each student set up a log where they will record observations with pictures of the progress of the plants' growth.

Variation: A fun alternative is to have students keep the Bean Buddies in their pockets or on a string as a necklace, explaining that the warmth from their bodies will help them germinate. Have them care for their Bean Buddy independently at home, and make it a challenge to see whose Bean Buddy is alive and thriving day after day.

ACADEMIC CONNECTIONS

Next Generation Science Standards Disciplinary Core Ideas

NGSS K.LS1.C

Organization for Matter and Energy Flow in Organisms – All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow.

NGSS 1.LS1.A

Structure and Function – All organisms have external parts... Plants also have different parts (roots, stems, leaves, flowers, fruits, and seeds) that help them survive and grow.



Observation Log

Name: _____

Project: _____

Week 1

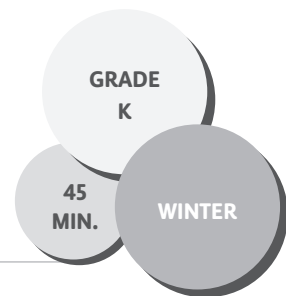
Week 2

Week 3

Week 4

From Beautiful Beans to Delicious Dip!

THEME: PREPARING AND ACCESSING HEALTHY FOODS



ESSENTIAL QUESTION

How can we work together to create a healthy snack?

LEARNING OBJECTIVE

✓ Students will be able to prepare fresh vegetables and herbs by hand.

LESSON DESCRIPTION

In this lesson, students learn to process fresh foods by hand as they prepare herbs and vegetables to enjoy with a bean dip.

MATERIALS

- A mix of dried beans for students to sort, count, and explore
- Food processor or blender
- Extension cord
- Spoon
- Can opener
- Measuring spoons and cups
- Serving bowl for dip
- Napkins
- 2 heads of cauliflower or broccoli or another vegetable that students can easily break down with their hands
- 2 bunches of herbs such as rosemary, thyme, or oregano
- Container for compost
- Materials for cleanup

For each group of 4–6 students:

- 1 bowl of produce
- 1 medium-sized bowl
- 1 small bowl for dip
- Several cutting mats to share
- Ingredients for bean dip (see recipe)

PREPARATION

- › Open the cans. Rinse and drain the beans.
- › Slice the citrus.
- › Set up an area in the room visible to students where you can plug in the food processor and make the bean dip as students watch. Have measuring cups and spoons and other ingredients stationed there.
- › Portion broccoli and herbs into bowls for students so that half of the class will be working on each.

Bean Dip Recipe Ingredients

NOTE: You can make a hummus-like dip with garbanzo beans and lemon, a black bean dip with cilantro and lime, or a white bean dip with parsley, rosemary, and thyme.

- 2 cans of beans (garbanzo, black bean, or white bean), drained and rinsed
- 4 Tbsp olive oil
- 4 Tbsp fresh leafy herbs such as parsley, cilantro, or basil
- 4 tsp herbs such as rosemary or thyme
- Pinch of salt, to taste

ACTION STEPS

1. Engage: Gather students in a circle, and tell them they'll be making a tasty snack together. Ask students to raise their hands if they've eaten beans before. Ask, *How do you like to eat them?* Take a few answers, and explain that today you'll be making a bean dip with herbs to eat with veggies. **(5 min.)**

2. Exploring the Ingredients: Give groups of students a bowl with a variety of dried beans, covered with a napkin. On the count of three, have them lift the napkin to see what's underneath. Give them a few minutes to explore. Provide challenges like, *Can you find the biggest bean? The smallest? Brightest? A solid color? Spotted? Smoothest?* Challenge students to count different types and compare: *How many red beans do you have? Are there more red or white beans? Are there more solid or spotted beans?* Then pass around a couple sprigs of whatever herbs you're using. Ask students to look at them, touch them, and smell them. Ask, *What does it smell like to you?* **(5 min.)**

3. Model: Say, *When you go back to your seats, you're all going to be my helpers for making our bean dip. Some helpers will work on our veggies, and some helpers will work on our herbs.* Show students how to break up the broccoli and how to pull herb leaves from the stems. Remind them that they won't want the broccoli too small, or they won't be able to dip it. **(5 min.)**

4. Wash Hands Break! (5 min.)

5. Prepping Veggies and Herbs: Give half the students the broccoli to break up and half the students herbs to pick and tear. Provide each group with a couple cutting mats as clean work surfaces to share, and have them put their finished product in the empty bowl you provide them. Circulate through the room, guiding students who need help. Gather the herbs and veggies, and have students clean up their spots. **(10 min.)**

6. Cooking Demonstration: Ask for students' attention at the station where you've set up your blender. Explain that you'll now show them

how to make the bean dip. Add your cans of beans and other ingredients to the blender, explaining and showing students each step. Blend the ingredients, then say, *I'm going to try it to see if it needs anything else.* After you've made adjustments and blended again, portion the dip into bowls for each group. **(5 min.)**

7. Tasting: Tell students that everyone is going to wait until you tell them to eat. Say, *We're going to be sharing our dip, which means making sure we don't take too much and that we don't share germs.* Explain that to prevent germs they'll only dip each piece of veggie into the dip once; model what that looks like. Give each group a bowl of dip. Have one student pass out plates and another student pass out a couple veggies to each student. Have everyone taste the bean dip together. **(5 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *How would you describe the flavor of the bean dip? What herbs can you taste that we smelled earlier?*
- *How did working together help us make this bean dip?*
- *How would you teach your family members to make bean dip? What tips would you give them?*
- *What else might taste good dipped in bean dip?*

ADAPTATIONS

Art and Math Extension: Have students sort and count dried beans over butcher paper to practice adding and subtracting. Make bean mosaic art by providing glue and construction paper. Make bean maracas by putting beans into cans, cardboard tubes, or just about anything!

ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.L.K.5.C

Identify real-life connections between words and their use (e.g., note places at school that are colorful).

CCSS.ELA-LITERACY.L.K.5.A

Sort common objects into categories (e.g. shapes, foods) to gain a sense of the concepts the categories represent.

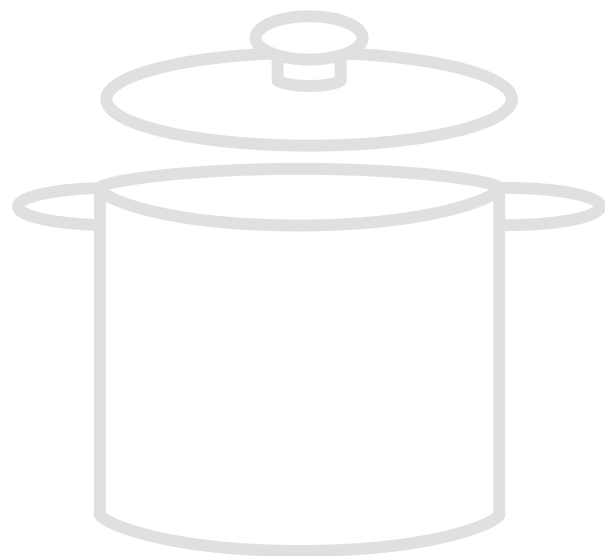
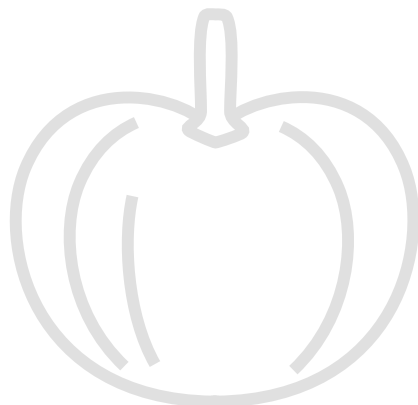
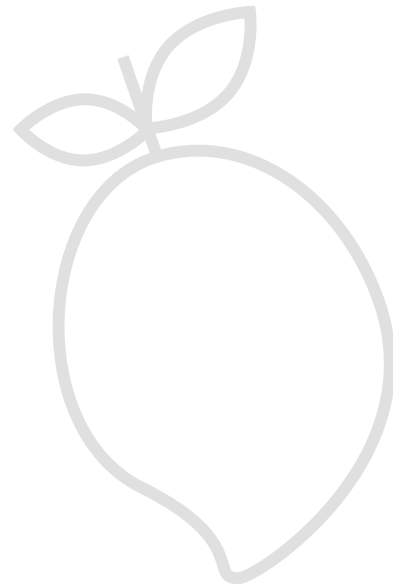
Math Common Core State Standards

CCSS.MATH.CONTENT.K.MD.B.3

Classify objects into given categories; count the number of objects in each category and sort the categories by count.

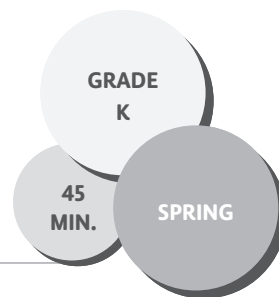
CCSS.MATH.CONTENT.K.CC.C.6

Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies.



Budding Tastes

THEME: MAKING HEALTHY FOOD CHOICES



ESSENTIAL QUESTION

Why is it important to try new things and to continue to try things we didn't like the first time?

LEARNING OBJECTIVES

- ✓ Students will be able to explain that our preferences can change over time.
- ✓ Students will be able to explain the “power of yet.”
- ✓ Students will be able to identify their own food preferences.

LESSON DESCRIPTION

In this lesson, students think about how people's food preferences can change over time. They engage in a sensory exploration of herbs, read a book about a character becoming more open-minded, draw pictures of their own food preferences, and consider the “power of yet.”

MATERIALS

- 5–6 empty egg cartons, half dozen or full
- Minced herbs from the school garden (a handful of each, see preparation below)
- A book about a main character becoming more open-minded and trying new foods, such as *Sylvia's Spinach* by Katherine Pryor, or *I Will Never Not Ever Eat a Tomato* by Lauren Child
- My Taste Buds! Worksheet (p. 97) for each student
- Crayons
- A simple snack from the garden, such as sliced radishes or air-popped popcorn with minced rosemary and butter or olive oil
- Paper towels

PREPARATION

- › Collect empty egg cartons to create a mini sensory station for small groups of 4–6 students. Place common herbs found in your school's garden in each section of the egg carton, for example, rosemary, lavender, parsley, lovage, mint, and thyme. You might want to mince the herbs beforehand, so they release more scent. If you don't have access to many fresh herbs, you can use common pantry ingredients, such as lemon juice, vanilla extract, and spices on cotton balls. Essential oils on cotton balls also work, if you have them available.
- › Photocopy the My Taste Buds! Worksheet.
- › Create a model of the worksheet to share with students by filling in a few foods you like and don't like yet but want to try.

ACTION STEPS

- 1. Sensory Exploration:** Pass out a sensory egg carton to each group of students. Instruct students to take turns smelling the contents of each section. Encourage them to pick up the herbs and rub them between their fingers, but remind them to put them back in the same section of the egg carton and not to taste. Instruct students to work in teams of two or three to see if they can recognize any of the smells. Ask them to share with one another which they prefer, explaining that the word *prefer* means to like

something the most. Ask, *Which of these do you think you'd prefer to eat?* (5 min.)

2. Reading: Tell students that you're going to read a book about a character who prefers to eat certain things. Read *Greens Eggs and Ham*, *Sylvia's Spinach*, or *I Will Never Not Ever Eat A Tomato*. During the read-aloud, pause and ask questions about the characters' motivations, for example, why they might not want to eat the food in the story. After the read-aloud, tell students to think about how the main character was able to change their mind. (10 min.)

3. Discussing Taste Buds: Instruct students to quietly stick out their tongues on the count of three. Say, *Look around. See those bumps on our tongues? Those are taste buds. They help us taste different flavors. Our taste buds send messages to our brain to help our brain decide if we like things. So our brain might think, "Wow this is a new taste, I'm not sure about this!" Sometimes when we try something new, right away our brain thinks, "I don't like this!" But really it takes trying something ten different times to really know whether we like something.* Have students count aloud together up to ten. Tell students about a food you used to not like; for example, say, *I used to not like parsley, but my whole family loves it, so I kept trying just a little bit to train my taste buds to like it. I'm happy because now I can enjoy parsley with my family.* Ask students, *What's something you used to not like but now you do?* Have students share with a partner and then have a couple students explain to the whole class their experience with a food they didn't always like. Say, *So if we try something new for the first time or even the second time, instead of saying, "I don't like this," maybe we can say, "I don't like this yet!" What do you think is different when we add the*

word "yet"? This helps us remember that maybe our taste buds just need a chance to try it a few more times. (5 min.)

4. Drawing Food Preferences: Show students your own drawing, explaining a couple of your pictures. For example, say, *On this side I drew roasted broccoli because I love it when it's roasted in the oven. And here I drew raw broccoli because I don't like that yet . . . but maybe I will if I try it a few more times.* Or *Over here I drew cottage cheese because it's a food I'd like to try.* Pass out the My Taste Buds! Worksheet and crayons to students. Circulate and encourage students to think of foods they'd be open to trying. (15 min.)

5. Tasting: While students are drawing, prepare a simple snack for them, such as popcorn with rosemary from the garden or sliced radishes with salt. Before eating, tell students that it's okay if they don't prefer something, but there are better ways to express that than saying "eww" or "yuck" because that can make it difficult for other people to enjoy it. Ask students what they can say instead. For example, "I don't prefer it," "I don't like this yet," or "My taste buds need more time!" Pass out the paper towels and snack as students are finishing their drawings. (5 min.)

REFLECTION

Have students discuss the following questions in small groups, then share with the class: (5 min.)

- *What are our taste buds?*
- *Why is it a good idea to try the same food more than once?*
- *What's the difference between saying "I don't like this" and saying "I don't like this . . . yet"?*
- *How can we be respectful of others who have different tastes than we do?*

ADAPTATIONS

Garden: If you have spring crops in your garden, such as fava beans, radishes, or lettuce, harvest these items with students, and make a salad together. Discuss with students the different flavors they are tasting and why they may or may not like them . . . yet.

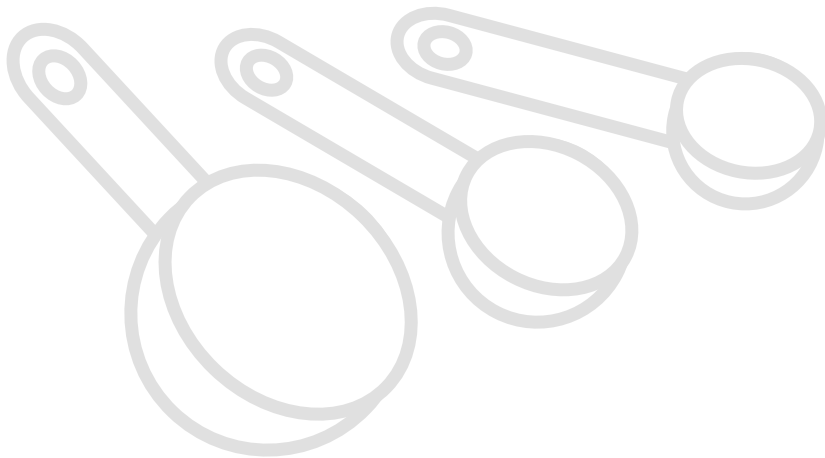
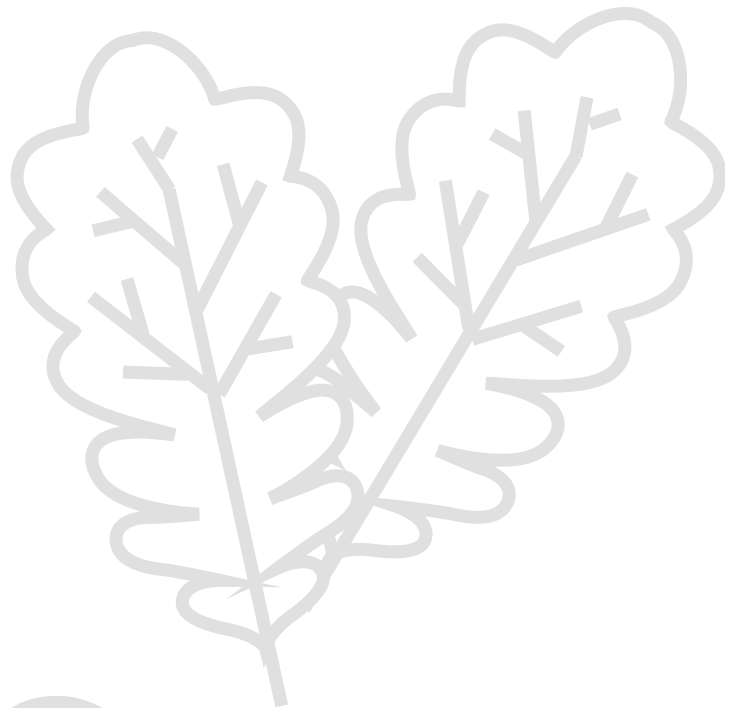
At-Home: Have students ask their caregivers to name a food they didn't like (yet!) when they were in kindergarten, but they do like now. Have students draw these foods for homework and then share them in class. You can also have students add to the My Taste Buds! Worksheet with their caregivers, and/or track the number of times they try a new food at home.

ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.RL.K.3

With prompting and support, identify characters, settings, and major events in a story.



Name: _____

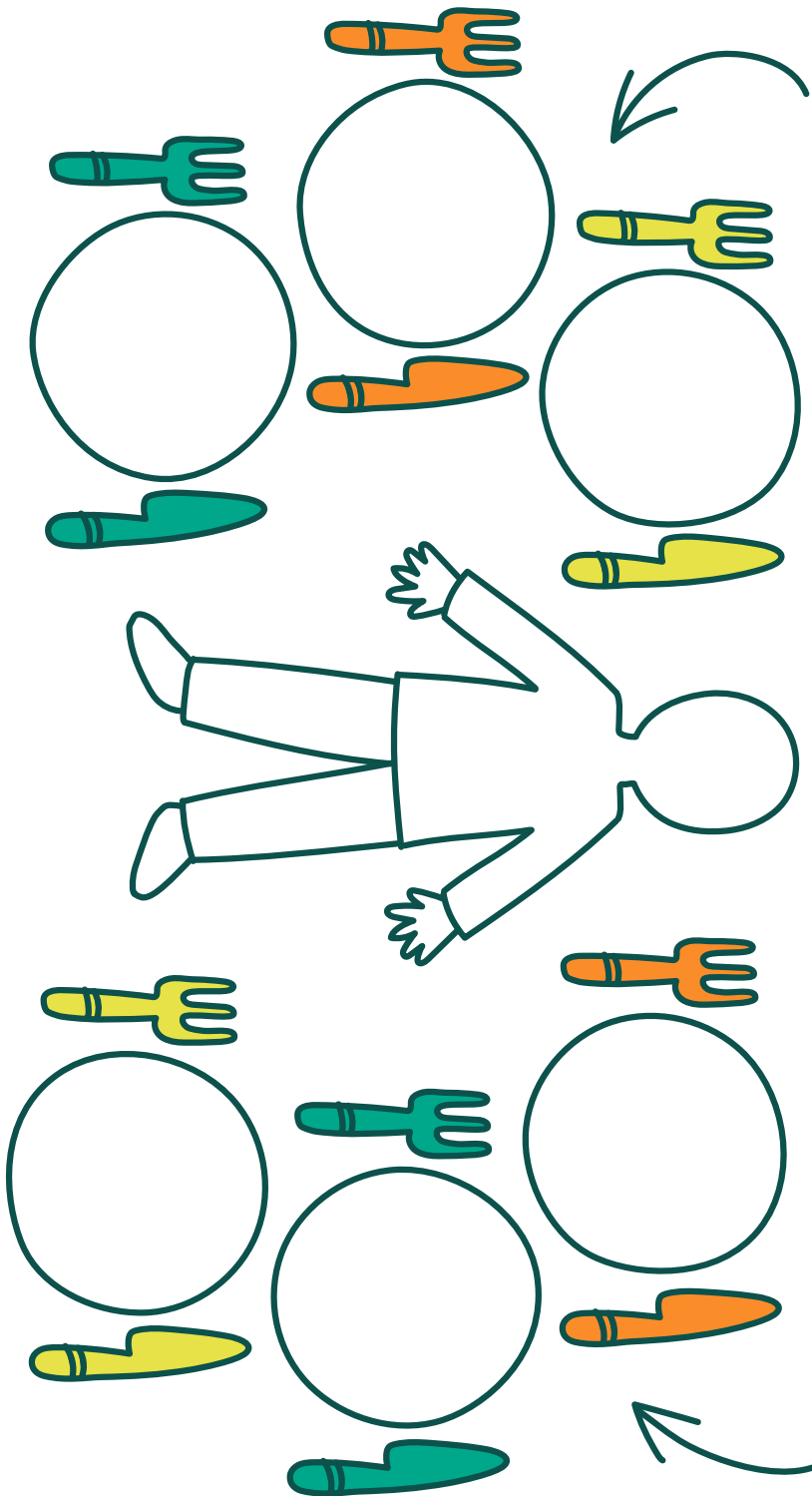
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My Taste Buds Worksheet

MY TASTE BUDS

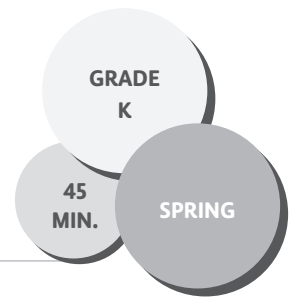
FOODS I LIKE

FOODS TO TRY



Perfect Parfaits

THEME: EXPLORING THE ECOLOGY OF FOOD



ESSENTIAL QUESTION

Where does food come from?

LEARNING OBJECTIVES

- ✓ Students will be able to identify the source of different ingredients in a yogurt parfait.
- ✓ Students will be able to assemble a yogurt parfait.

LESSON DESCRIPTION

In this lesson, students consider where their food comes from by matching pictures of parfait ingredients to their food sources (cows, bees, and plants.) They then make their own yogurt parfait by counting and layering spoons of ingredients.

MATERIALS

For each student:

- Cup—clear plastic if you want to see the parfait layers
- Spoon
- 40 spoons
- 25 bowls
- 2 quarts of berries (whatever kind is available)
- 2 quarts of plain yogurt (1/4 cup each for 32 people)
- 8 cups of granola (bulk bin) or toasted, rolled oats (4 Tbsp each for 32 people)
- 4 cups of seeds, such as pumpkin or sunflower (2 Tbsp each for 32 people)
- Honey
- Food Source Cards (pp. 100–101)
- Scissors or paper cutter
- Materials for cleanup

PREPARATION

- › Photocopy and cut out sets of Food Source Cards for groups of 4–6 students.
- › Prepare trays for groups of 4–6 students with the following:
- › Bowl of berries with 2 spoons
- › 2 bowls of yogurt with 2 spoons
- › Bowl of granola with 2 spoons
- › Bowl of seeds with 2 spoons

Yogurt Parfait Recipe

- 1/4 cup (4 Tbsp) plain yogurt
- 1/4 cup (4 Tbsp) berries
- 3 Tbsp granola or toasted, rolled oats
- 2 Tbsp seeds

ACTION STEPS

1. Engage: Gather students in a circle and ask, *Where does our food come from?* When students say the grocery store, ask, *Where does the store get its food?* Once they start thinking about farms and gardens, ask, *How do farms and gardens get their food?* Keep discussing until they've traced food back to plants and animals. **(5 min.)**

2. Sorting Foods by Source: Explain, *I'm going to give you cards with pictures of foods we eat and cards with pictures of where those*

foods come from. Your job will be to match them together. Pass out Food Source Cards to groups of students, and circulate through the room, checking on students' progress and asking encouraging questions. **(5 min.)**

3. Sharing: Go over each pair of pictures with students and discuss them. Ask, for example, *How does yogurt come from a cow? Or, How does honey come from a bee?* **(5 min.)**

4. Model: Explain that they're going to make a delicious snack with all the ingredients they just sorted. Show them each ingredient, asking students to identify them. Model making a parfait, explaining, *For yogurt, you'll take four scoops. For berries, you'll take four scoops. For granola, you'll take three scoops. And then for seeds, you'll take two scoops.* As you're demonstrating, clearly count out your scoops, and ask students to show you the numbers by counting on their hands. Explain to students that you'll give them these ingredients to share at their tables. Ask, *What will sharing look like while we create our parfaits?* Discuss how you're going to add one ingredient at a time, passing the spoon to the next person to add their amount. **(5 min.)**

5. Wash hands break! (5 min.)

6. Making Yogurt Parfait: Pass out trays of ingredients to groups. Pass out a cup to each student. Say, *First we'll add the yogurt. Show on your fingers how many scoops we're going to take of yogurt.* Then have students take turns. Do this for each ingredient. Finally, ask students to make a signal to show that they'd like honey. Walk around and add a drizzle of honey for those students. **(10 min.)**

7. Tasting: Have a couple helpers pass out spoons to each student, and have students wait until you tell them to try the parfaits. As you're eating, ask students to describe what they're tasting. **(5 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *What ingredients are in our parfaits? Where did these ingredients come from?*
- *What else would you like to eat in a yogurt parfait?*
- *How did you share with your classmates?*

ADAPTATIONS

Extension: Have students create picture recipes by drawing the layers in their parfait and putting numbers beside each layer to represent the number of tablespoons they added of each ingredient.

ACADEMIC CONNECTIONS

Next Generation Science Standards, Life Science Disciplinary Core Idea

NGSS K.LS1.C

Organization for Matter and Energy Flow in Organisms – All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow.

Math Common Core State Standards

CCSS.MATH.CONTENT.K.CC.B.5

Count to answer “how many?” questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1-20, count out that many objects.

Food Source Cards



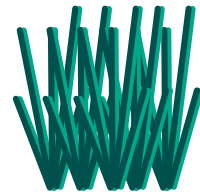
Bee and Beehive



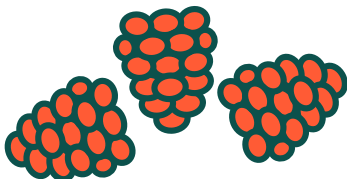
Rolled Oats



Honey Jar



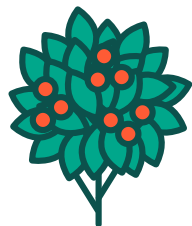
Oat Grass



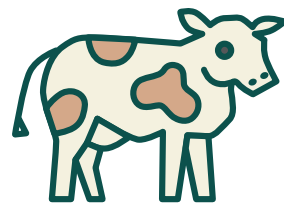
Berries



Yogurt



Berry Bush



Cow

Food Source Cards



Sunflower



Sunflower Seeds



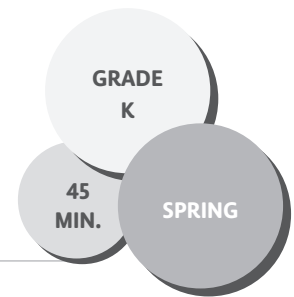
Pumpkin



Pumpkin Seeds

Sunflower House

THEME: GROWING AND ACCESSING HEALTHY FOODS



ESSENTIAL QUESTION

What do flowers need to grow?

LEARNING OBJECTIVE

✓ Students will be able to sow sunflower seeds.

LESSON DESCRIPTION

In this lesson, students taste sunflower seeds and sow sunflower seeds in cups after reading *Sunflower House*.

MATERIALS

- *Sunflower House* by Eve Bunting
- 1 packet of sunflower seeds to plant
- 1 sample cup for each student
- 12-quart bag of organic seed starting mix, in a tub for easy cleanup
- 2-3 cups of shelled, unsalted sunflower seeds to eat
- Permanent marker
- Trays for carrying cups
- Spray bottle
- Observation Log (p. 105, optional)

PREPARATION

- › Identify an outdoor planting space, if possible. If not, prepare an indoor planting space. You may want to put newspaper or vinyl tablecloths down to minimize the mess.
- › Coordinate with the classroom teacher to create a schedule for students to water and care for their seedlings.

- › Pre-irrigate your seed starting mix by adding water until it is about as damp as a wrung-out sponge.
- › Poke 3–4 drainage holes in the bottom of each sample cup.
- › Prepare trays with the following for groups of 4–6 students:
 - › Sample cups
 - › Sunflower seeds
 - › A container of organic seed starting mix
 - › 2 spoons or other small scoops to use in the seed starting mix

ACTION STEPS

1. Tasting: Gather students and explain that because it's spring it's a great time to plant flowers. Give students clues about what flower you're talking about without naming it. Say, *The flower seed that we're going to plant today grows big and tall, even bigger than me. The head of the flower moves to face the sun during the day. Birds love to eat the seeds, and so do I! Can you guess what it is?* Pass around edible, shelled sunflower seeds for students to try. You may want to explain how we use sunflower seeds to make many other foods like sunflower oil and sunflower seed butter. **(5 min.)**

2. Reading: Read *Sunflower House*. As you're reading, stop and ask questions to check for

understanding. For example, say, *It says I wonder what the word “sow” means. Can we guess based on the picture?* Have students turn to a partner to think-pair-share. After reading, invite students to act out certain events from the book with their bodies, such as planting seeds. **(10 min.)**

3. Model: Explain to students that just like the child in the story, they’re going to sow sunflower seeds today. Show them how to plant their seeds. Fill your sample cup with seed starting mix, and tell students that you’ll make a hole as deep as your first knuckle. Have students point to their first knuckle as you point to yours. Place two seeds in the hole, and ask students, *Now what should I do? Remind me, what do seeds need to grow?* Cover your seeds, and spritz your soil with as many sprays needed to saturate the soil, and tell students that they should only spray their soil that amount of times. **(5 min.)**

4. Sowing Seeds: Give groups of 4–6 students a tray with the materials, and remind them to share, taking and planting just two seeds. While they’re working, walk around the room, and write each student’s name on their cup. Have students clean up their spots. **(15 min.)**

5. Sharing: Gather in a circle, and ask students to share where they plan to plant their sunflower seedling or to whom they plan to give the plant. **(5 min.)**

(After Class): Determine how you will care for the sunflower seeds as they germinate and grow. You might ask the classroom teacher ahead of time if they can grow in a windowsill in the classroom, with the students rotating the job of

watering them every day with a spray bottle to keep the soil moist (but not soggy). Or you might put them all in a tray and grow them in another location such as a school greenhouse, if you have one, and then bring them back to students when they’re ready to transplant. Because you planted two seeds in each cup, many will grow two plants. In those cups, once plants are about four inches tall, cut off the smaller of the two to let the other one grow.

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *How will we take care of our sunflower seeds over the next couple of weeks?*
- *When do you think we’ll see them sprout?*

ADAPTATIONS

Follow-up: Have each student set up a log where they’ll record observations with pictures of the progress of the plants’ growth.

Garden Setting: Talk to your school grounds/maintenance staff to determine if there is a location where you could establish a sunflower house. Mark off the area and prepare the soil, then bring students out to transplant their sunflower seedlings. Grow them over the summer, and harvest and enjoy the seeds together in the fall!

ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.RL.K.1

With prompting and support, ask and answer questions about key details in a text.

Next Generation Science Standards, Life Science
Disciplinary Core Idea

NGSS K.LS1.C.

Organization for Matter and Energy Flow in
Organisms – All animals need food in order to
live and grow. They obtain their food from plants
or from other animals. Plants need water and
light to live and grow.



Observation Log

Name: _____

Project: _____

Week 1

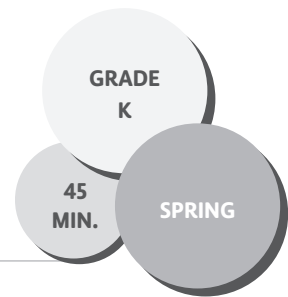
Week 2

Week 3

Week 4

Sunny Honey Seed Snacks

THEME: PREPARING HEALTHY FOOD



ESSENTIAL QUESTION

Why are seeds an important part of the foods we eat?

LEARNING OBJECTIVES

- ✓ Students will be able to explain that seeds are an important part of our diets.
- ✓ Students will be able to prepare a healthy snack rich in seeds.

LESSON DESCRIPTION

In this lesson, students create a healthy seed snack and further explore seeds by sorting and grouping seeds.

MATERIALS

- Bowl of sorting seeds for each group of 4–6 students (these can be expired seed packets, dried seeds saved from the garden, or inexpensive beans from bulk bins at the grocery store)
- ½ egg carton for each student (or a different container students can sort seeds into, for example, an ice cube tray)
- Ingredients for Honey Seed Snack (see recipe)
- At least 3 measuring tablespoons
- Measuring cup
- Plate for each student
- Optional: To show the sources of each ingredient, find a picture of or real example of each of the following: a sunflower, a sesame plant, a whole grain oat or stalk of oat grass, a honeycomb, and an almond
- Materials for cleanup

PREPARATION

- › Set up a small table that students can easily gather around. On the table, place a bowl, your ingredients, and the measuring spoons and cups. If you collected images or objects to show the sources of each seed, display those at the table next to each ingredient (e.g., put the sunflower head next to the sunflower seeds).

Honey Seed Snack Recipe

- 1 cup rolled oats
- 1 cup sesame seeds, plus more for coating
- 1 cup sunflower seeds
- 1 cup honey
- 1 cup nut butter (almond butter or sunflower butter; be sure to check the class's allergy list beforehand)
- 1 cup carob powder

Mix oats, sunflower seeds, honey, nut butter, and half of the sesame seeds until it's all incorporated. Roll the dough into 1-inch balls or smaller and then roll in sesame seeds.

Note: ½ cup = equals 8 Tbsp

ACTION STEPS

- 1. Seed Exploration:** Place a bowl of seeds in front of groups of students. Have students use their hands to explore the seeds, reminding them to keep the seeds inside the bowl. Ask them to describe what they feel and what they see. Say, *Do you know that inside each of these is a baby plant?! What are these called?* (3 min.)

2. Seed Sorting: Pass out sorting trays (egg cartons) to small groups of students, and give them different prompts, depending on the types of seeds you've provided. You might have students sort based on color, shape, size, or texture. For example, say, *Find the smallest seeds, and put them in their own space. Now find the biggest seeds, and put them in a different space, etc. (5 min.)*

3. Explain the Activity: Explain to students, *Many seeds are edible, which means we can eat them, and they're healthy for us too! Today we're going to be making a sweet snack with them.* Help students understand that seeds contain all the starting materials necessary to develop into complex plants. Say, *Inside of a seed is everything a plant needs to grow into a big plant. Because of this, they are really nutritious or good for our bodies.* Name the ingredients for students, and briefly describe how the snack is prepared. Then say, *As you're sorting your seeds in any way you'd like, I'll call you up in groups to help me make the dough. (2 min.)*

4. Making the Dough: Call up students in groups of four to six and have them wash their hands. (Another adult might be able to help students who are the next group up.) As groups are washing their hands, have the rest of the class share ways they sorted their seeds, and record a list. Then have each group focus on measuring one ingredient. Use a measuring spoon to divide the work among more students, depending on your class size. Don't worry about amounts being so precise as long as they're roughly even. **(15 min.)**

5. Making the Snack: Give each student a plate, and provide groups with a small bowl of

sesame seeds. Show students how to sprinkle a small amount of seeds onto their plate, and scoop a small amount of the prepared dough onto each plate. Demonstrate rolling a small piece of dough into a ball in your hands and rolling the ball around in the seeds. Circulate through the room, guiding students who need support. **(5–10 min.)**

6. Tasting: Have students count down from three aloud as a group to try the honey seed snacks all together. Ask students to describe the taste and texture of the snack. **(5 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- What were the ingredients in our seed snacks?
- Why are seeds a healthy food to eat?
- What other seeds or nuts could we add to the snack?

ADAPTATIONS

Garden: Take students on a guided walk through the garden to find and collect various seeds and pods.

At Home: Have students fill out the Seeds We Eat Worksheet (p. 108) with their caregivers.

ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards

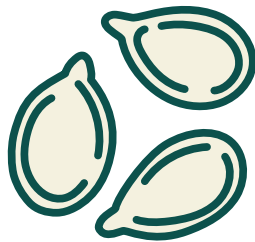
CCSS.ELA-LITERACY.SL.K.1

Participate in collaborative conversations with diverse partners about *kindergarten topics and texts* with peers and adults in small and larger groups.

Name: _____ Date: _____

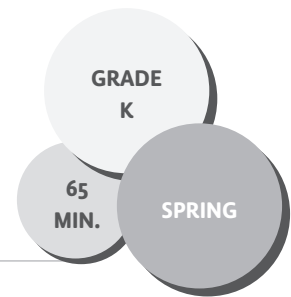
Seeds We Eat Worksheet

Directions: Draw pictures of foods that contain seeds you eat at home.



People Who Feed Us

THEME: CONNECTING FOOD, CULTURE, AND COMMUNITY



ESSENTIAL QUESTION

Who helps provide the food we eat?

LEARNING OBJECTIVES

✓ Students will be able to explain how we rely on our community to eat.

✓ Students will be able to depict a community member who is integral to how we get our food.

LESSON DESCRIPTION

In this lesson, students consider the various community members who prepare or provide the food they eat, and they create a portrait honoring one of these people.

MATERIALS

- *Before We Eat: From Farm to Table* by Pat Brisson or *Zora's Zucchini* by Katherine Pryor
- Chart paper
- Drawing paper
- Crayons (if you have the resources and ambition, tempera paints would be a nice choice for this project)
- Pencils
- Washable black marker for each student

PREPARATION

- › Create a model portrait beforehand using the materials you'll provide students.
- › Print people portraits to project or display.
- › Write the following sentence starter on chart paper: *I drew a picture of _____*

because _____

- › Divide art material into sets for groups of students to share.

SAMPLE CHART OF COMMUNITY FOOD HELPERS

- | | |
|---------------------------|-------------------------|
| • Baker | • Fisher |
| • Beekeeper | • Food packager |
| • Cafeteria cook | • Food pantry volunteer |
| • Corner store clerk | • Food truck driver |
| • Family members who cook | • Grocery store clerk |
| • Farmer | • Rancher |
| | • Restaurant cook |

ACTION STEPS

1. Reading: Gather students in a circle. Ask, *Who helps you get the food you eat?* Students responses may be limited to their family. Explain that you're going to read a book about other people in the community who help give you food. Read a book such as Pat Brisson's *Before We Eat*. Ask, *Who are the people who helped make the dinner that the people ate? Who else helped?* Alternatively, to initiate a conversation about depending on community for the foods we eat, read Katherine Pryor's *Zora's Zucchini*, about a girl who grows zucchini and shares it with her community. **(10 min.)**

2. Brainstorming: Have a conversation with students to generate a list of people in the

community who help provide the food they eat. You might ask students, *Who prepares the food we eat at school? Who helps with the food we get at a store? Who makes the food we eat at a restaurant?* Adapt the questions and conversations to what is relevant to your community. Use chart paper to make a list of the people you come up with together. As you make the list, comment on how nice it is that so many people in our community help make the food we eat. **(10 min.)**

3. Model: Tell students they are going to draw a portrait of a person in their community who helps prepare their food. Explain that a portrait is a picture of someone that usually just shows a person's head and shoulders. Show students your portrait. Talk through the process of how they will create their own. Explain that the first step is to draw a picture of someone in pencil. Point out how you use all the space on your page for the person; encourage students to do the same. Explain that the next step is to trace their person with black marker. The last step is to color their picture with crayons or tempera paints. **(5 min.)**

4. Creating Portraits: Pass out pencils and paper to students, and have them draw a portrait of their person. Remind them to take their time and to raise their hand when they're ready for a black marker. Then have them trace. Tell them they will complete the third step of coloring their portraits at the end of the lesson, if there is time. **(15 min.)**

5. Sharing: Have students bring their work back to the circle and share with their neighbor. Give students a sentence starter to structure their talk such as, *drew a picture of _____*
because _____

As they discuss, add comments that build appreciation and value for all the people in our community who prepare our food. Also discuss how nice it is when community members care for each other. **(5 min.)**

6. Follow-Up: If you have time, pass out crayons or tempera paints and have students complete their portraits with color. Otherwise, you might ask if the classroom teacher would like to continue this activity the following day. **(15 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *What does it mean to be part of a community?*
- *How do people in a community help each other?*
- *How does it make you feel to think of all the people who help provide food?*

ADAPTATIONS

Classroom Extension: Invite community members to class to share about their role in growing or preparing food for the community.

Community Food Helpers Video: Throughout your year, make short videos of community members who have participated in FoodCorps events, such as family members, farmers, etc. Ask each person, *What role do you play in growing and preparing food for the community?* Then share this video with students at the beginning of this lesson to encourage them to consider the real, local food helpers in their community.

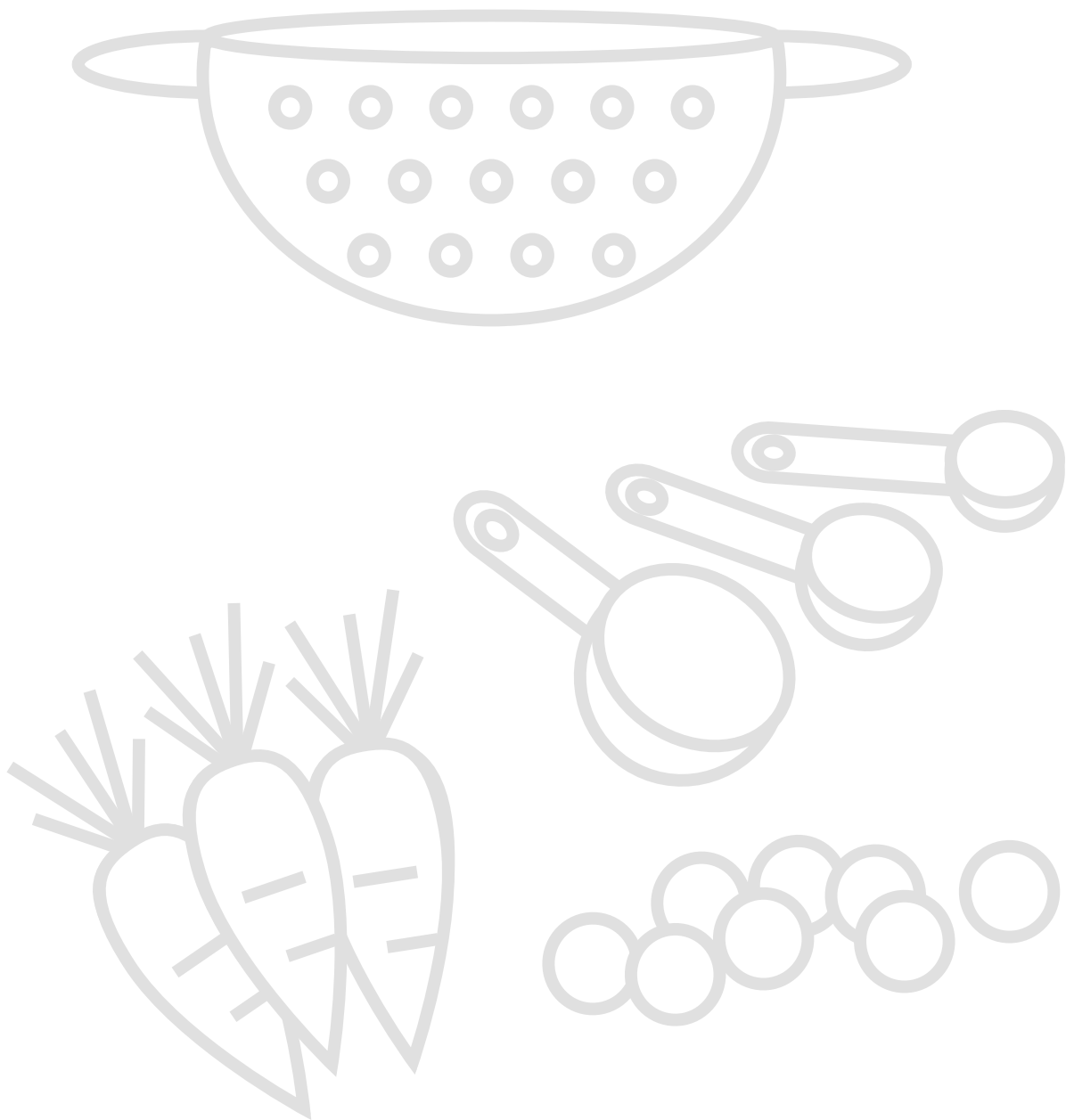
ACADEMIC CONNECTIONS

Common Core State Standards for English

Language Arts

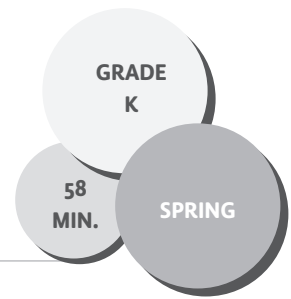
CCSS.ELA-LITERACY.SL.K.1

Participate in collaborative conversations with diverse partners about *kindergarten topics and texts* with peers and adults in small and larger groups.



Plant a Pizza

THEME: GROWING AND ACCESSING HEALTHY FOOD



ESSENTIAL QUESTION

Where do our favorite foods come from?

LEARNING OBJECTIVES

- ✓ Students will be able to plant seeds and starts to create a pizza garden.
- ✓ Students will be able to explain the connection between a popular food and the plants that comprise it.

LESSON DESCRIPTION

In this lesson, students listen to a story read aloud and then plant vegetable starts that can be used for making pizza. In addition, they will design their own pizza slice with their favorite toppings and then put them together to make class pizza pies.

MATERIALS

One of the following:

- *All the Way to America: The Story of a Big Italian Family and a Little Shovel* by Dan Yaccarino—to emphasize the cultural background of the food
- *Fidget Grows a Pizza Garden* by Jodie Fitz—to emphasize the process the students will go through
- *How a Seed Grows* by Helene J. Jordan—to emphasize the plant life cycle as students will be planting starts
- Broadfork or shovel
- Seeds and starts for planting

- Tomato
- Basil
- Wheat seeds or bell pepper starts (see chart below)
- 4–5 watering cans
- For each student:
 - My Favorite Pizza Slice Worksheet (p. 115)
 - Scissors
 - Glue stick
- Large piece of butcher paper for Class Pizza Pie! poster
- Masking tape
- Colored dot stickers to divide students into planting groups (optional)

PREPARATION

- › Prepare the bed you'll be planting by clearing out weeds and using a broadfork or other tool to loosen soil. If you are starting a new bed in the garden for this, consider making it in a circle to represent a pizza. If not, this also works in a garden bed of any shape.
- › On a large piece of butcher paper, draw three large circles. The radius of each circle should be the length of one the pizza triangles from the Pizza Slice Worksheet. This is where students will tape their completed pizza triangles at the end of the lesson to create whole pizza pies.
- › Determine how you will divide the class into three groups for planting.
- › Prefill watering cans.

PLANT THE FOLLOWING

- | | | |
|---|---|--------------|
| • Tomato starts | Veggie Toppings | Herbs |
| • Basil starts | • Green onions | • Oregano |
| • Hard Red Spring
Wheat seeds
(if possible in
your region) | • Dark leafy greens
(spinach, chard, kale) | • Thyme |
| | • Zucchini | • Rosemary |
| | • Bell pepper | |
| | • Hot chili peppers | |
| | • Onions | |

ACTION STEPS

1. Engage: Gather students in a circle and say, *Today we're going to plant a really popular food in the garden. It comes in a triangle shape, it's cheesy and saucy and has chewy crust. Do you know what it is? (Pizza!) Have you ever seen pizza growing in a garden? Well, how do you think we're going to do it then? (5 min.)*

2. Reading: Read the book you've selected to students, helping them understand the connection between growing plants and eating pizza. Ask, *What are the ingredients that go into pizza that we can grow in our garden?* Introduce to students the ingredients you'll be planting today by showing them the plant seeds and starts. **(5 min.)**

3. Making My Favorite Pizza Slice: Explain to students they'll get a chance to create a visual of their favorite pizza slice. Show them the worksheet. Explain that while they're drawing their favorite toppings on their pizza slices, you'll take one group at a time to plant the pizza garden. If you have them, pass out dot stickers with three different colors, red for tomato, green for basil, and yellow for wheat, for example, so students will be able to easily identify what group they're in. **(20 min.)**

4. Planting Rotations: Call up one group at time to plant with you, demonstrating how to plant the seed or start they're working with. Depending on the amount of students and space you have, you might have pairs work together to plant one start. Have students water their plant, and be sure this small group understands how their plant plays a part in making pizza. **(6 min. each group)**

5. Class Pizzas!: Give each student a piece of tape, and have them affix their pizza slice onto the class pies. Discuss how everyone's different preferences can come together to create one big pie. **(5 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *What are the plants that we planted today that would help us make pizza?*
- *What part of pizza do tomatoes make? What part of pizza does wheat make? etc.*
- *Ask yourself: Was I safe and respectful in the garden today?*
- *Ask yourself: What was something helpful that I or a classmate did in the garden today?*

ADAPTATIONS

Circular Bed Variation: If you have the space, make a circular pizza garden, planting your toppings in different wedges of the circle.

Different Theme Beds: Invite students to share common or favorite dishes from their communities, and then work with them to

plan theme beds to plant the ingredients for these dishes.

Extension: Consider placing figurines of cows and pigs in the pizza garden to honor where cheese, pepperoni, and sausage come from.

Follow-Up: In the fall, make pizza with the now second graders, making your own homemade tomato sauce and topping pies with veggies and herbs from the garden.

ACADEMIC CONNECTIONS

English Language Arts Common Core
State Standards

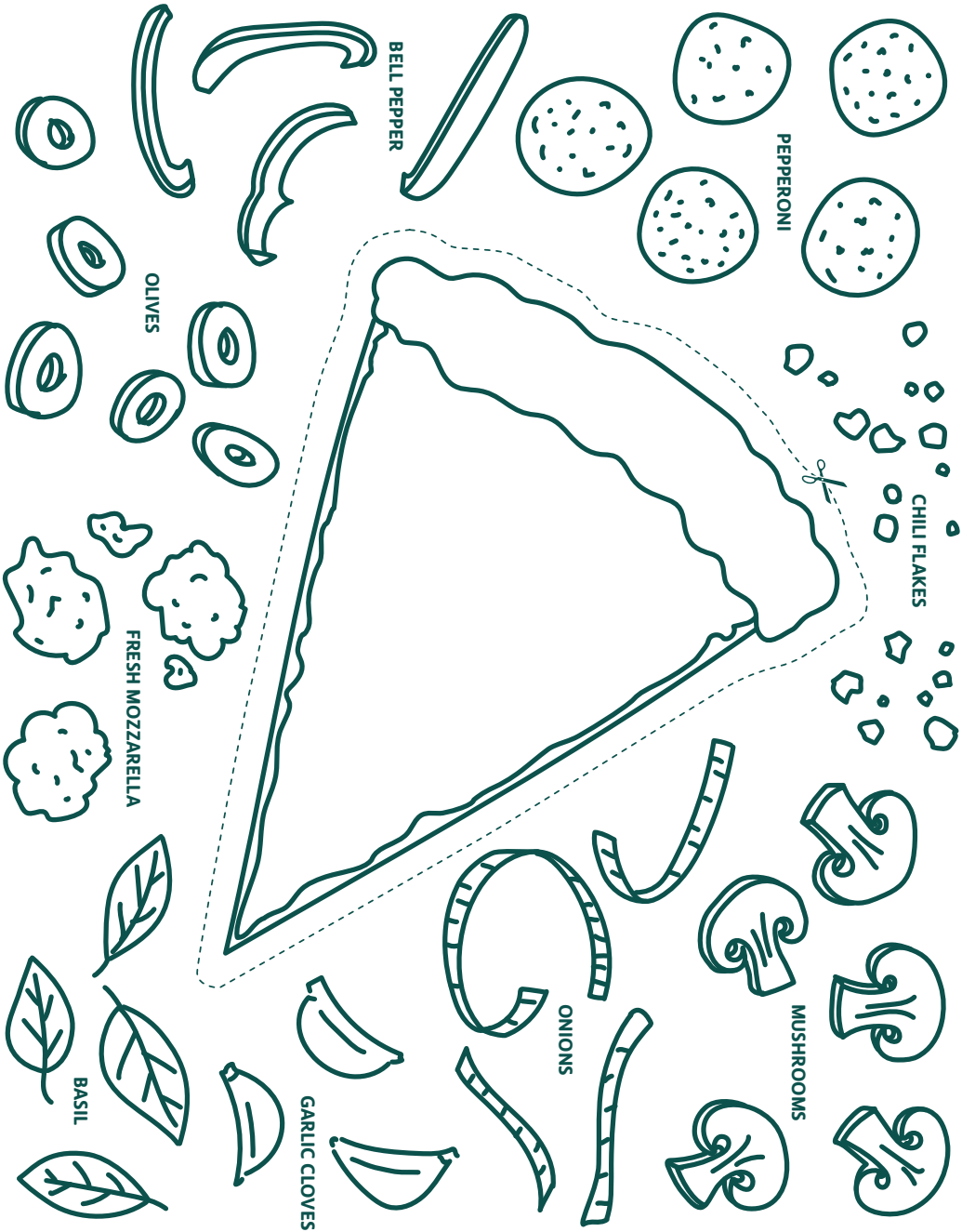
CCSS.ELA-LITERACY.RL.1.1

Ask and answer questions about key details in a text.

Name: _____ Date: _____

My Favorite Pizza Slice

Directions: Draw and color your favorite pizza toppings on your pizza slice. Then cut out your slice.



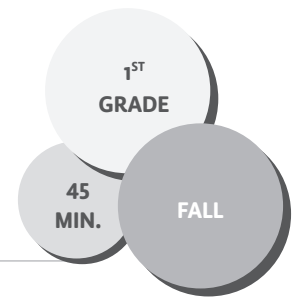


First Grade

LESSONS

Sensory Explorations

THEME: LIVING UP TO OUR FULL POTENTIAL



ESSENTIAL QUESTION

Why is it important to pay attention using our five senses in the garden?

LEARNING OBJECTIVE

✓ Students will be able to describe their natural environment based on sensory observations.

LESSON DESCRIPTION

In this lesson, students engage in a medley of sensory activities as an introduction to the garden, including making a sound map, doing a blind tasting of garden fruits and vegetables, and creating collections of objects with opposite attributes from inside the garden.

MATERIALS

For each student:

- Paper and clipboard
- Pencil
- 1 empty dozen egg carton for each group of 3 students
- Permanent marker
- 3 or more fruits, vegetables, and/or aromatic herbs from the garden for students to taste; examples might include berries, apples, cherry tomatoes, sugar snap peas, broccoli, mint, or basil
- A bowl for each sample of fruits, vegetables, or herbs

PREPARATION

- › Start gathering empty egg cartons from your community a couple weeks before the lesson

to make sure you have a sufficient amount—about ten.

- › Prepare egg cartons by writing opposite adjectives on the bottom of each carton. For example, write *smooth* down one half of an egg carton and then *rough* down the other half. Other adjective pairs might be *shiny* and *dull*, *alive* and *dead*, *soft* and *hard*, *wet* and *dry*, and the like.
- › Prepare a model egg carton with the words *edible* and *inedible* on the bottom. Find six edible objects to put into the carton on the edible side and six inedible objects to put into the inedible side.
- › Harvest and wash your produce, and place each into a bowl from which you can later pass out samples to students.

ACTION STEPS

1. Introduction: Gather students in a circle, and explain that today they're going to use their five senses to get to know the garden. Ask students to name the five senses. (**5 min.**)

2. Making a Sound Map: Tell students that the first sense they'll be using is hearing, and explain that they're going to draw a map of the garden, but instead of drawing a map of the things they see, they'll draw a map of the things they hear. Say, *You'll sit or stand somewhere in the garden and maybe close your*

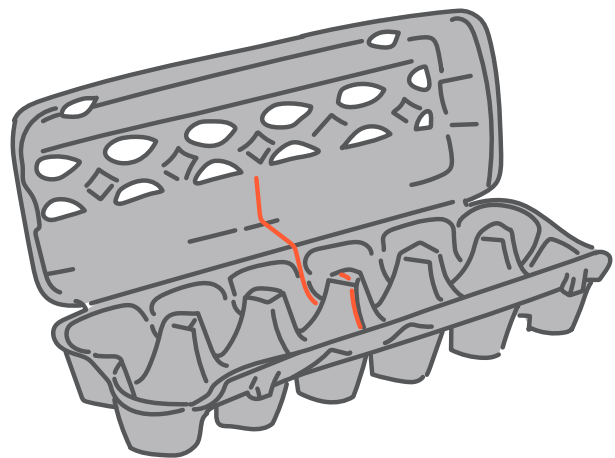
eyes, and if you hear a bird from this direction, you'll open your eyes and draw a bird in the part of the garden where you think you heard it. If you hear leaves blowing in the wind in this direction, then draw the leaves blowing in that direction. We're going to see if we can stay in one place and draw our sound maps for five minutes. Do you think we can do it? Pass out a piece of paper to each student. Have students mark X in the middle to represent themselves, and let them know the signal to return to the circle. Have students scatter around the garden where you can still see them and then set the timer. After five minutes, gather students back in the circle, and have them show their sound maps to the students sitting next to them before sharing with the class some of the things they heard. **(10 min.)**

3. Hand Washing Break! (5 min.)

4. Blind Tasting: Tell students that they will use their sense of smell and taste to try some items from the garden. Have students close their eyes. Pass out the first sample into each student's hands. Ask students to smell the item, and describe what they smell. Next have them taste it. Say, *What words would you use to describe what you taste? What does this remind you of?* Have students open their eyes. Show them the food they just tasted and then move on to the next sample. **(10 min.)**

5. Collecting with Egg Cartons: Explain that students will be exploring the garden using their five senses. Show students the example egg carton filled with the six edible and six inedible objects you collected. Say, *On this side I have one kind of thing, and on this side is the opposite kind of thing. Look closely. Can you*

guess what the opposite words are? Give students time to guess and then reveal the words. Explain that they'll have a chance to collect items and create a collection to share with their classmates. Pass out distinct egg cartons to groups. Alternatively, if you'd like to simplify the activity, you can reinforce one concept by having all students look for the same attributes, for example, living and dead. Rather than guessing once they return to the circle, students can display and share their collections. **(10 min.)**



REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *Why do you think it's important to use all our senses when we explore in the garden?*
- *What was the most interesting thing you discovered in the garden today?*
- *Ask yourself: How can I be safe and respectful in the garden?*

ADAPTATIONS

Simplified Sound Map: You can also create a sound map as a class by sitting together in a circle and having students close their eyes. Each time they hear a new sound, they hold up a finger.

After five minutes, they open their eyes and share what they heard (and where) while the teacher records their observations on chart paper.

Meet a Tree Extension: Have students play the game Meet a Tree. Split students into pairs, and have one partner close their eyes, while the guiding partner leads the pair to a tree or shrub. The student keeps their eyes closed while touching and smelling the tree or shrub. The guiding partner can direct the closed-eye partner to interesting parts of the tree or shrub to explore. Then the guiding partner leads the closed-eye partner back to the starting place, where they must find the tree or shrub the pair met.

Human Camera Extension: This activity is similar to Meet a Tree. The guiding partner (the photographer) brings their partner (the camera) to a beautiful plant or view in the garden. Once there, the photographer positions the human camera, perhaps guiding the student's chin up or down and having the student open their eyes, like a shutter, to take a mental snapshot of what they see. The human camera should quickly close their eyes again, and the photographer can take a couple more pictures in different spots before they switch roles.

ACADEMIC CONNECTIONS

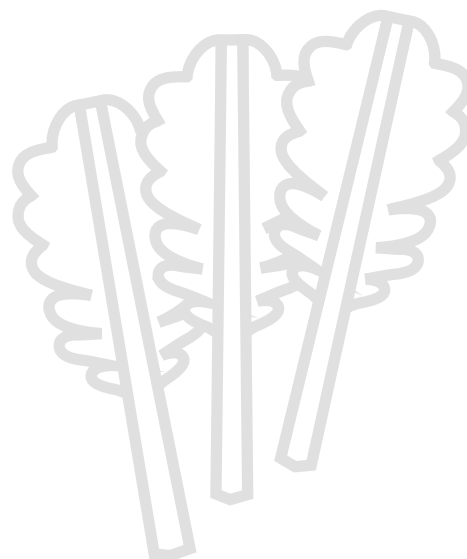
English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.L.1.1.F

Use frequently occurring adjectives.

CCSS.ELA-LITERACY.L.1.5

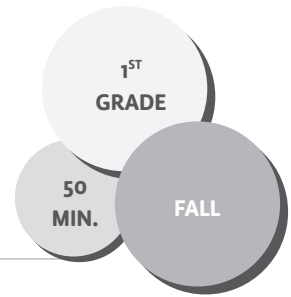
With guidance and support from adults, demonstrate understanding of word relationships and nuances in word meanings.



Go, Grow, Glow

Adapted from Life Lab's *The Growing Classroom*

THEME: MAKING HEALTHY FOOD CHOICES



ESSENTIAL QUESTION

How can eating certain foods help our bodies grow strong and healthy so that we can be who we want to be and do what we want to do in the world?

LEARNING OBJECTIVES

- ✓ Students will be able to explain how eating certain foods helps them be healthy.
- ✓ Students will be able to identify foods that fall under each go, grow, and glow category.

LESSON DESCRIPTION

In this lesson, students play go, grow, and glow charades, learning about the different foods that help their bodies have energy (go), grow strong (grow), and stay healthy (glow). They then draw themselves in action and at their best, with connections to the foods that enable them to enjoy those activities. This lesson is designed to be taught in conjunction with winter lesson Go, Grow, Glow Quesadillas and spring lesson Plant a Go, Grow, Glow Bed.

MATERIALS

- Index card for each student
- Go, Grow, Glow Poster (p. 123)
- Go! Grow! Glow! Worksheet (p. 124) for each student
- Projector and document camera or chart paper and markers
- Colored pencils and crayons

PREPARATION

- › If you don't have a document camera to project the worksheet, create a version of it on chart paper to fill in with your own model.
- › Photocopy the Go! Grow! Glow! Worksheet.

ACTION STEPS

1. Engage: Gather students in a circle, and ask them to think about their favorite activity, like running, reading, etc. Pass out index cards, and have each student write the activity on their index card. Circulate through the room, and help students write if needed. **(5 min.)**

2. Playing Charades: Then say, *We're going to play a game where you act out your favorite activity and then we have to guess what you're doing.* Take volunteers to stand up in the middle of the circle and act out their activity. Then have students show their card to see if the class was able to guess it. Play a new round by collecting everyone's cards, shuffling them, and taking volunteers to act out a random activity from the pile. You might have to support students in reading each other's writing. **(10 min.)**

3. Explain: Explain, *Did you know there are certain foods we eat that give us energy to do our favorite things? These are the "go" foods.* Have students wiggle their bodies to show using energy, then say, *There are also foods that help*

us grow and get strong. These are “grow” foods. Have students show their bicep muscles. Then say, *There are also foods that help our skin, teeth, and hair look nice; help our brain think; and help our body feel good. These are foods that help us “glow”!* Have students give a full-toothed smile, and frame their faces with their hands. **(5 min.)**

4. Guessing Game: Show students the Go, Grow, Glow Poster, and go over some foods in each category saying, *Grains like bread and rice help us go! Protein-rich foods like beans, nuts, dairy, and meat help us grow! Fruits and vegetables help us glow!* For each category have students pantomime the gesture you taught them to reinforce the concept. Then play a game where you call out a food, and students must guess which category it goes in by performing the corresponding gesture. For example, say, *Chicken!* and then have students make a muscle. Or *Cucumber!* and have students make a big, glowing smile. **(10 min.)**

5. Model: Model for students how they’ll be filling in the Go! Grow! Glow! worksheet, using either the document camera or chart paper. Explain aloud while drawing a picture of yourself in the center of the wheel doing your favorite activity. Then draw some of the corresponding go, grow, and glow foods from each section of the Go Grow Glow Poster on the outer part of the wheel, emphasizing that go, grow and glow foods help give us the energy, strength and health to do our favorite things. **(5 min.)**

6. Making a Go, Grow, Glow Wheel: Pass out worksheets to students and then circulate through the room, guiding students to refer to the poster to remember which foods match which category (go, grow, or glow). **(10 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *What are some go foods you like eating?*
- *What are some grow foods you like eating?*
- *What are some glow foods you like eating?*

ADAPTATIONS

Tasting Extension: Have students make a go, grow, and glow snack, such as crackers with hummus and vegetables from the first grade lesson The Great Balancing Act or a yogurt parfait with granola from the kindergarten lesson Perfect Parfait.

ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.SL.1.1

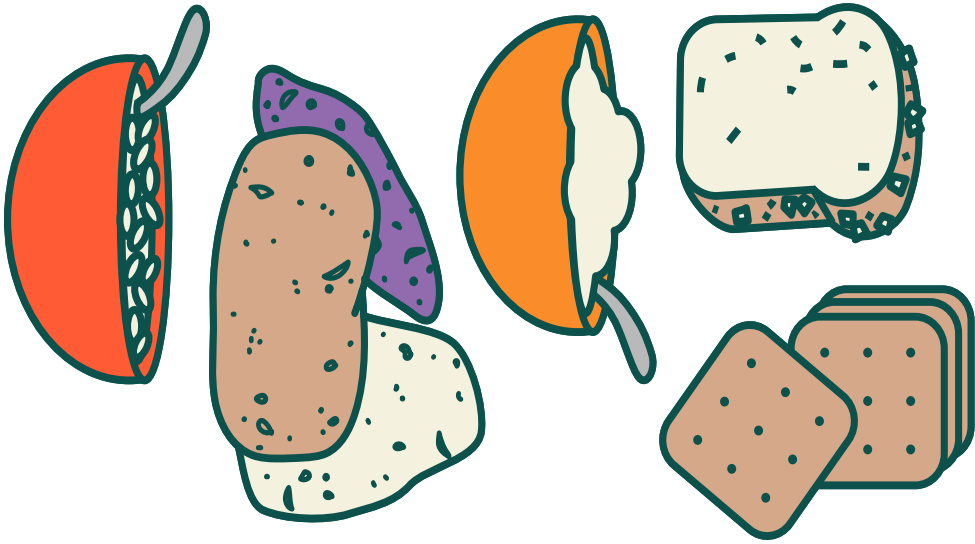
Participate in collaborative conversations with diverse partners about *grade 1 topics and texts* with peers and adults in small and larger groups.

CCSS.ELA-LITERACY.L.1.1.J

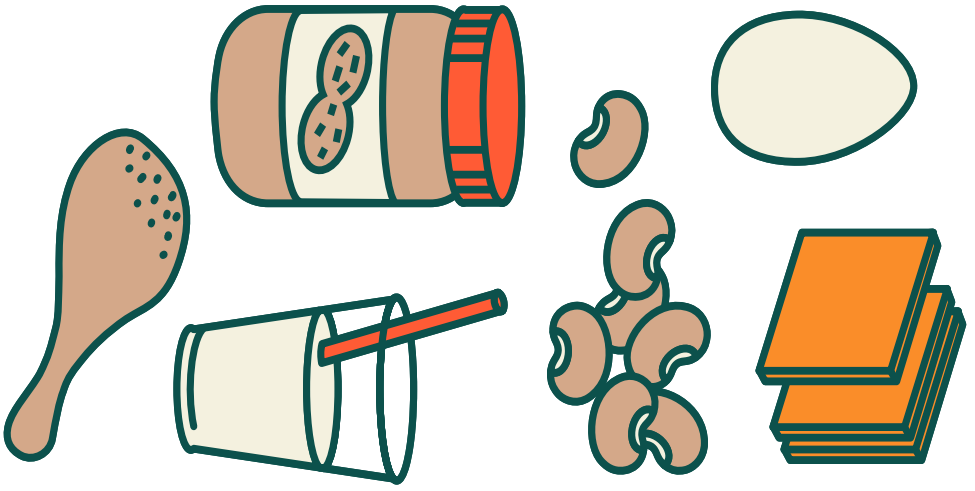
Produce and expand complete simple and compound declarative, interrogative, imperative, and exclamatory sentences in response to prompts.



GO
FOODS



GROW
FOODS



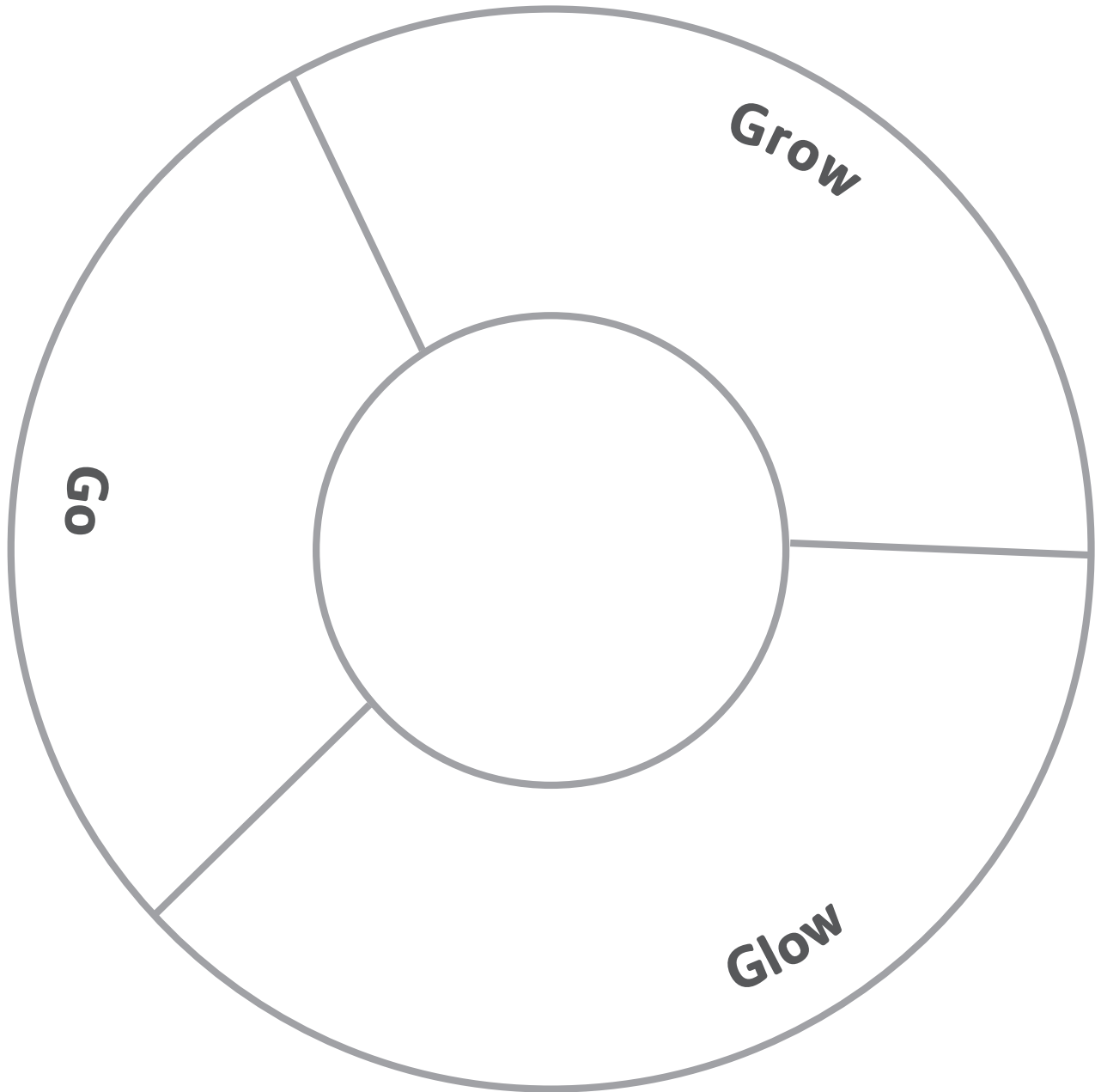
GLOW
FOODS



Name: _____ Date: _____

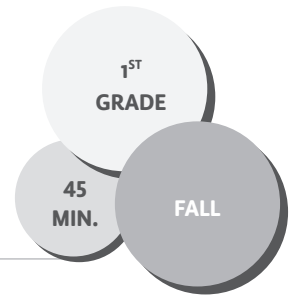
Go! Grow! Glow! Worksheet

Directions: Draw a picture of your favorite activity in the middle circle.
Draw the go, grow, and glow foods you like to eat on the outside of the circle.



Plant Part Scavenger Hunt

THEME: EXPLORING THE ECOLOGY OF FOOD



ESSENTIAL QUESTION

Why is each part of the plant important?

LEARNING OBJECTIVE

✓ Students will be able to recognize and name the six plant parts.

LESSON DESCRIPTION

In this lesson, students learn the six plant parts through reading a picture book, singing a song, and hunting for the six plant parts in groups in the garden.

MATERIALS

- *Tops and Bottoms* by Janet Stevens
- “Roots, Stems, Leaves” song by the Banana Slug String Band
- Plant Part Poster (p. 127)
- 6 baskets or trays (for students to collect plant parts)

PREPARATION

- › Learn the song, “Roots, Stems, Leaves” by the Banana Slug String Band.
- › Display the Plant Part Poster.

ACTION STEPS

1. Reading: Gather students in a circle in the garden, and tell them they’ll be learning about the six parts of a plant. Read *Tops and Bottoms*

about a clever hare and a lazy bear who agree to split the tops and bottoms of plants that Hare grows on Bear’s land. If you don’t have the text but have access to a computer and projector, find a video of a read aloud on YouTube. As you’re reading, ask questions about the characters, setting, and plot to check for understanding. For example, ask, *How do you think Bear is feeling right now? How do you know? What do you think Hare is going to do? Why do you think he did that?* Discuss how, like Hare in the story, we grow plants to eat different parts of the plant. Ask students if they know the other names of the plant parts. **(15 min.)**

2. Singing: Teach students the “Roots, Stems, Leaves” song. Have students crouch down and touch their feet for roots, put their arms at their sides for stems, put their arms out for leaves, frame their faces with their hands for flowers, use their hands to make a circle the size of an apple above their heads for fruit, and “rain” their fingers down to the floor again for seeds. **(5 min.)**

3. Explain: Show students the Plant Part Poster. Focus on one plant part at a time, discuss its function, and then brainstorm edible examples. For example, say, *The roots help hold the plant in place and gather nutrients and water from the ground. Can you think of any roots we eat? The stem helps the water and nutrients travel through plant and keep*

the plant tall and reaching for the sun. Can you think of any stems we eat? The leaves help the plant make its own food! Can you think of any leaves we eat? The flower attracts bees to help pollinate the plant, so the plant can reproduce and make seeds for new plants. Can you think of any flowers we eat? Can you think of any seeds we eat? The fruit grows around the seeds to protect them. Can you think of any fruits we eat? **(10 min.)**

4. Scavenger Hunt: Divide students into six groups, one for each part of the plant. Explain that together with their group they'll have to find their assigned plant part. Give each group a basket, tray, or other container to put their collections into. Remind students to only pick plants that have ten or more of that part and to harvest with hands to protect the plant. Let them know the signal you'll use to call them back when it's time. **(10 min.)**

5. Sharing: Come back into a circle, and have groups show and tell about their different plant parts. **(10 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- Which plant parts do you like to eat?
- What clues did you look for to find your plant part?
- Which part of the plant holds the plant in place in the ground?
- Which part of the plant helps the plant make its own food?

ADAPTATIONS

Language: Sing a few rounds of “Roots, Stems, Leaves” in English, speeding up and slowing down. Next, try the song in Spanish. Sing *raiz* for root, *tallo* for stem, *hoja* for leaf, *flor* for flower, *fruta* for fruit, and *semilla* for seed.

ACADEMIC CONNECTIONS

Next Generation Science Standards, Life Science Disciplinary Core Idea

NGSS LS1.A

Structure and Function – All organisms have external parts . . . Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow.

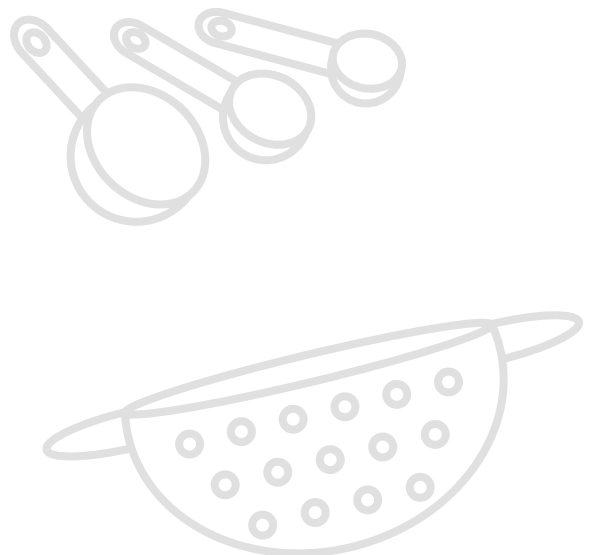
English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.RL.1.7

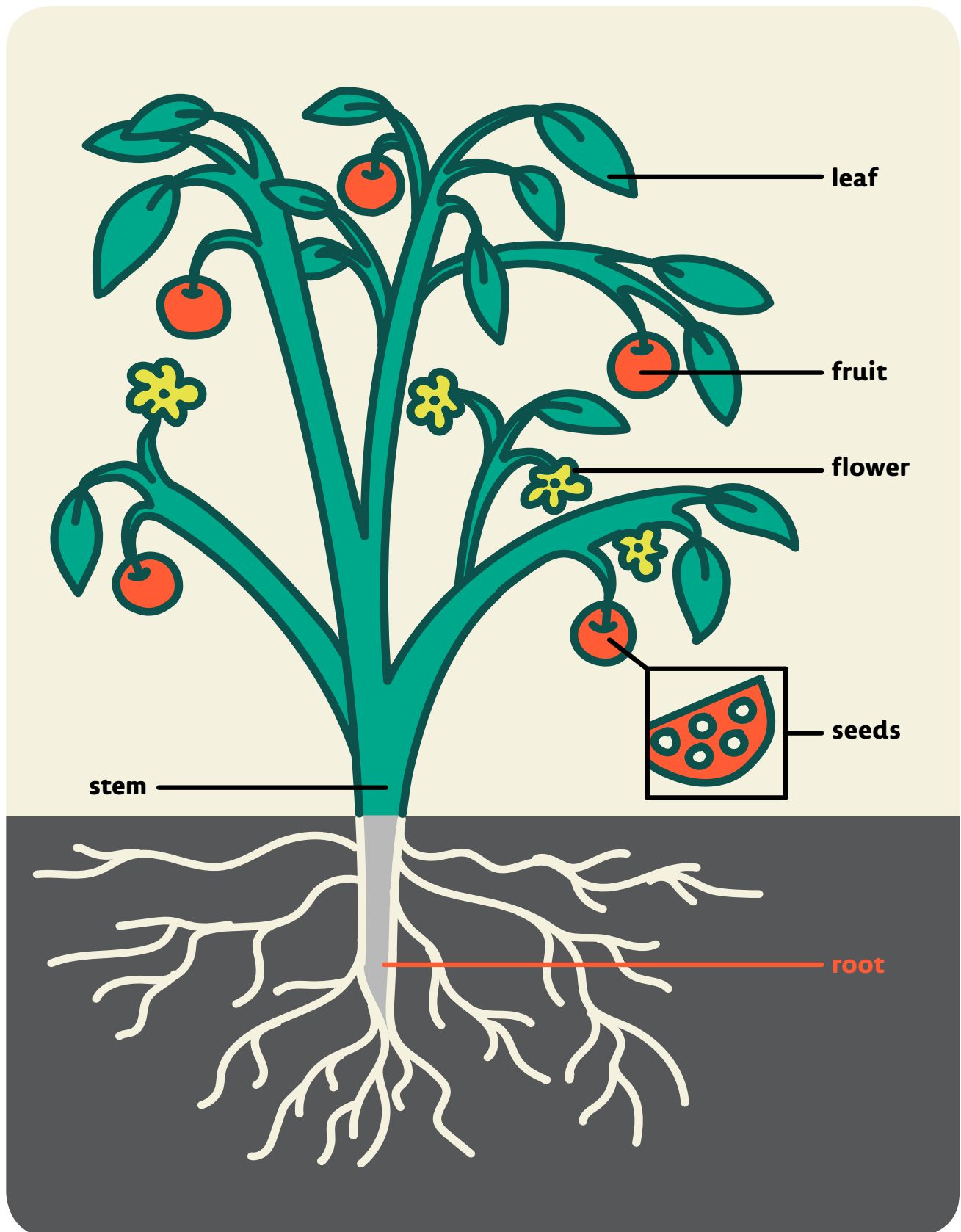
Use illustrations and details in a story to describe its characters, settings, or events.

CCSS.ELA-LITERACY.SL.1.4

Describe people, places, things, and events with relevant details, expressing ideas and feelings clearly.

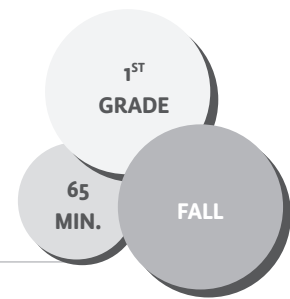


Plant Part Poster



Planting a Tops and Bottoms Bed

THEME: GROWING AND ACCESSING HEALTHY FOOD



ESSENTIAL QUESTION

Why is each part of a plant important for people to eat?

LEARNING OBJECTIVES

- ✓ Students will be able to name the different parts of a plant.
- ✓ Students will be able to plant starts in a garden.

LESSON DESCRIPTION

In this lesson, students review the book *Tops and Bottoms*, which they read in the fall lesson, Plant Part Scavenger Hunt, and rotate through activities in the garden centered on leafy tops and root bottoms. Students plant a Tops and Bottoms bed, make leaf rubbings, and use potatoes as stamps for printing. They then sample the greens and roots they've planted. (It will be helpful to have the classroom teacher and a second adult volunteer supervise the craft rotations while you assist students in planting.)

MATERIALS

For Whole-Class Activities:

- *Tops and Bottoms* by Janet Stevens
- Hand soap or hand sanitizer
- Paper towels
- Small, raw sample of vegetables students planted, such as turnips and lettuce or collards and beets

For Planting Station:

- Transplants of leafy greens, such as lettuce, kale, chard, or spinach (1 for every 2–3 students)

- Seeds for root vegetables, such as carrots, radishes, or beets
- 5 trowels
- 3–5 watering cans
- Plant labels
- Pencils to write on plant labels
- Access to hose for refilling water

For Leaf Rubbing Station:

- Crayons with paper peeled off
- 1 sheet of paper for each student
- Clipboards

For Stamping Station:

- 4–5 large potatoes
- Tempera paint or a few different colored stamp pads
- 1 sheet of paper or cardstock for each student
- Newspaper or vinyl tablecloth
- Pencil or permanent marker (for writing names on prints)

PREPARATION

- › Determine the vegetables you'll be planting based on your region. Depending on your location, you might want to schedule this lesson as early in the fall as possible, so your plants get plenty of light and time to grow before winter.
- › Scout locations to set up the two different craft projects. You might put down newspaper or vinyl tablecloth secured with heavy rocks. Keep in mind, you'll need a smooth surface for both crafts so the texture of the

table or ground doesn't show up in the print you make, which is why clipboards might come in handy.

- › Peel the paper off the crayons so that students have a broad surface for making leaf rubbings.
- › Slice the potatoes in half. You can use a paring knife to carefully create stamps from the cut sides of your potatoes, such as hearts, stars, and triangles.
- › If using tempera paint, put different paints into small trays (you can reuse the tops of large yogurt containers or other food packaging). Designate one potato stamp for each color.
- › Troubleshoot each craft beforehand to anticipate any snags with materials students might experience.
- › Place all materials for the Stamping Station at one table and those for the Leaf Rubbing Station at the other table. Place all materials for the Planting Station near the bed where you'll be planting and all materials for the tasting near the space where you'll gather the class at the end for the tasting.
- › Wash and prepare the vegetables for tasting, slicing root vegetables into a small piece for each student.

ACTION STEPS

1. Engage: Gather students in a circle, and reread or review the book *Tops and Bottoms*. Ask students *How is Hare able to trick Bear? Ask, If you were Hare, what plants would you plant to trick Bear? Which parts of the plant would you like to keep?* Discuss how there are different parts of every plant that we like to eat. Explain, *Today we'll be planting a Tops and Bottoms bed, which means that we'll plant some plants that we eat the tops*

or the greens of, and we'll plant some plants that we eat the bottoms or the roots of. (5–10 min.)

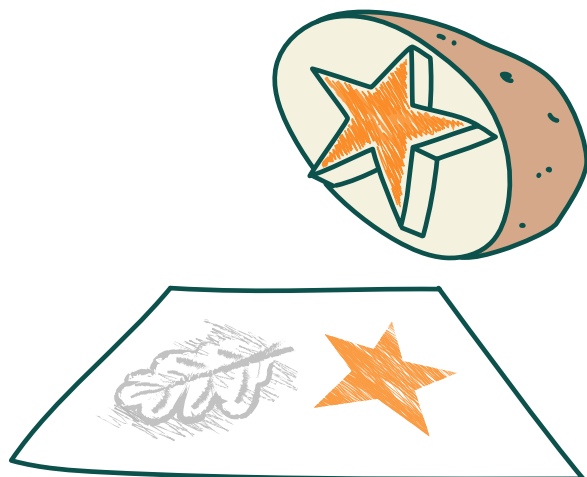
2. Rotations: Briefly explain the rotations to students, showing them the two plants you'll be planting. Ask them to determine which is grown for the tops and which is grown for the bottoms. Say, *While some students are planting, other students will be making Tops and Bottoms art! We'll make art with leaves from our garden and use potatoes as stamps and then we'll switch so everyone gets a turn.* Divide the class into three groups, and demonstrate the signal they'll hear to know it's time to switch. **(5 min.)**

a. Planting: Gather a small group around the bed you'll be planting in, and demonstrate how to plant your transplants or seeds. Model tool safety, pointing out to students how you keep your tool low and go slow, minding your neighbors. Pass out a start or a handful of seeds to pairs of students or groups of three if you have a large class or small planting space. As students are digging their holes, monitor that they're not planting too close to their neighbors. Once the plants are in the ground, pass out watering cans to planting partners, and make sure plants are thoroughly watered. Help students make a label with the name of what they planted and the date, and stick it in that part of the bed. **(10 min.)**

b. Leaf Rubbing: Have students explore the garden to find a couple leaves of which they'd like to make rubbings. If you don't have an extra adult for supervision, you might look for leaves as a class before you break into groups, showing students how to use two hands to harvest a leaf so they don't hurt the rest of the plant. Have students turn the leaf so its

underside is face up with its veins in relief. Next have them place paper on top, and rub a crayon on its side across the leaf, pressing until they see the leaf's impression coming through. Students can exchange leaves once they've made a rubbing with their own. **(10 min.)**

c. Stamping: Show students the potato stamps you've created, and explain the importance of keeping the stamps with their "home color" so that we don't mix all the colors. Then have students use halved potato stamps to create prints. They can do this on cardstock to make cards or bookmarks, or use blank paper to create works of art. **(10 min.)**



3. Wash Hands Break! Have students clean up their station and then wash their hands. **(10 min.)**

4. Tasting: Have students gather back in a circle. Pass out small samples of your leaf and root vegetables. **(5 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *What parts of the plant are the tops that grow above the ground? What parts of the plant are the bottoms that grow below?*
- *What interesting plant parts did you find in our garden today?*
- *How would you teach someone how to plant in a garden?*
- *When do you think our tops and bottoms will be ready to harvest (or pick)?*

ADAPTATIONS

Song: Sing "Roots, Stems, Leaves" by the Banana Slug String Band to review the six plant parts.

Observation: Return to the garden once a week for students to observe their seedlings' germination and growth.

ACADEMIC CONNECTIONS

Next Generation Science Standards, Life Science Disciplinary Core Idea

NGSS: LS1.A

All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water and air. Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow.

CCSS.ELA-LITERACY.RL.1.2

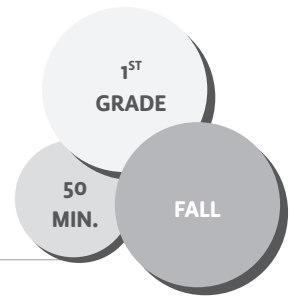
Retell stories, including key details, and demonstrate understanding of their central message or lesson.

CCSS.ELA-LITERACY.RL.1.3

Describe characters, settings, and major events in a story, using key details.

Plant Part Wraps

THEME: PREPARING AND ACCESSING HEALTHY FOOD



ESSENTIAL QUESTION

How can we work together to prepare a healthy snack?

LEARNING OBJECTIVE

✓ Students will be able to prepare fruits and vegetables for a healthy snack.

LESSON DESCRIPTION

In this lesson, students create plant part wraps to reinforce their knowledge of the six plant parts and discover a healthy snack option.

MATERIALS

- 1 Set of Plant Part Sorting Cards for each group of 4–6 students (p. 134–138)
- Plant Part Posters (optional)
- Simple Kid-Friendly Dressing Ingredients (optional, see below)
- 2–3 cutting mats for each group
- Materials for cleanup

A tray for each group of 4–6 students with one sample of each plant part. For example, your trays might have the following:

- ½ head of cauliflower
- 5 chard leaves
- 2–3 clementines
- Bowl of shredded beets
- Bowl of sliced celery
- Bowl of sunflower seeds

PREPARATION

- › Create a small poster for each plant part including its name and multiple visual examples (optional).
- › Photocopy and cut out a set of Plant Part Playing Cards for each group of students.
- › Wash the produce, and sort it into amounts sufficient for each table group. Prepare whatever produce you don't have the time, tools, or adult supervision for each student to do on their own (e.g., it makes sense to shred beets beforehand if you don't have the time to show students how to use the tool, don't have enough box graters to go around, or don't have enough eyes to watch tiny fingers at work.)
- › If using salad dressing, make it ahead of time and refrigerate.

NOTE: The six ingredients for your wraps will largely depend on what's in season in your location and what you can access—the chart below provides some suggestions. For this age group, anything they can pick, peel, shell, or hull is great (e.g., give each student a clementine to peel, have a table break down a head of cauliflower into tiny florets, shell peas, etc.)

Roots	Stems	Leaves
Carrots	Celery	Cabbage
Parsnips	Asparagus	Kale
Beets	Scallion	Romaine lettuce
Radishes		

Flowers	Fruits	Seeds
Broccoli	Tomatoes	Sunflower
Cauliflower	Apples	Pumpkin
Borage	Grapes	Pomegranate
Nasturtium	Bell peppers	
Violets	Cucumbers	
	Berries	
	Clementines	

Simple Kid-Friendly Dressing

- >3 parts olive oil
- >1 part rice vinegar
- >1 Tbsp honey
- >Salt to taste

ACTION STEPS

1. Engage: Gather students in a circle and ask them to turn and talk to a neighbor about what they like to eat for breakfast. Then say, *I ate seeds and a twig for breakfast. Can you guess what I ate?* Eventually you can reveal that you ate oatmeal and cinnamon, explaining that our foods can come from different parts of the plant. Tell students that today they'll be making a delicious snack using all six plant parts. **(5 min.)**

2. Sorting Plant Parts: Ask students if they can name the six plant parts. If you've made visual posters, reveal each one as students accurately

name them. Remind students that different plants are grown because we like to eat different parts of the plant. Give them an example, such as, *People like to eat celery or asparagus because they are tasty stems, but I don't know many people who grow strawberries to eat the stems. What part of the plant do people grow strawberries for?* (The fruit!) Explain that we also get different nutrients from different parts of plants and that with some plants we can eat all the parts, such as beets and radishes. Pass out the Plant Part Playing Cards for students to sort at each table group. Circulate through the room while they're sorting, asking encouraging questions about why they made certain choices. **(10 min.)**

3. Model: Model making a Plant Part Wrap. Take a lettuce or other large leaf, and fill it with a variety of fruits, vegetables, and seeds before wrapping it up. Tell students that each table group will get all the ingredients they need at their table and that they'll be sharing. Show them one table's set, and to check for understanding, ask them questions about what they see. For example, *If there are five clementines here and five people at my table, how many should I take?* (Just one!) *If there's a bowl of sunflower seeds, do I get to take the whole bowl?* (No) *I should take a little spoonful like this and wait and see if there's more after everyone's had some. Should I stick my hand right in the bowl or use a spoon?* (Spoon!) Why is that important? (Germs) **(5 min.)**

4. Wash Hands Break! (5 min.)

5. Making Plant Part Wraps: Pass out ingredients to each group and circulate through the room, providing guidance and support and reminding students to take only what they need so everyone has some. **(10 min.)**

6. Tasting: Have students wait until every student has their plant part wrap ready before tasting. **(10 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *What words describe what you taste?*
- *Which was our stem ingredient? Which was our seed ingredient?*
- *What other fruits would you like to eat in a Plant Part Wrap? What other roots would taste good?*
- *How could you make this at home?*
- *What did your team do that worked well when you were trying to share everything? What do you want to work on for next time?*

ADAPTATIONS

Age: This activity works well for all ages by giving older students increased autonomy. For older students who already have familiarity with knife safety and washing vegetables, have groups work together to prepare everything (e.g., while one group is using a box grater to shred beets, another is making bite-sized celery pieces, and yet another is using a salad spinner to wash and prepare a head of lettuce. Older students can also make the optional dressing.

Garden: Go on a plant part scavenger hunt in the garden. Look for and harvest the six plant parts together with your students. Once you have all six parts, chop, grate, or process everything together. Hand each student a big lettuce leaf, and have them add the other five parts to make their own wrap.

ACADEMIC CONNECTIONS

Next Generation Science Standards, Life Science Disciplinary Core Idea

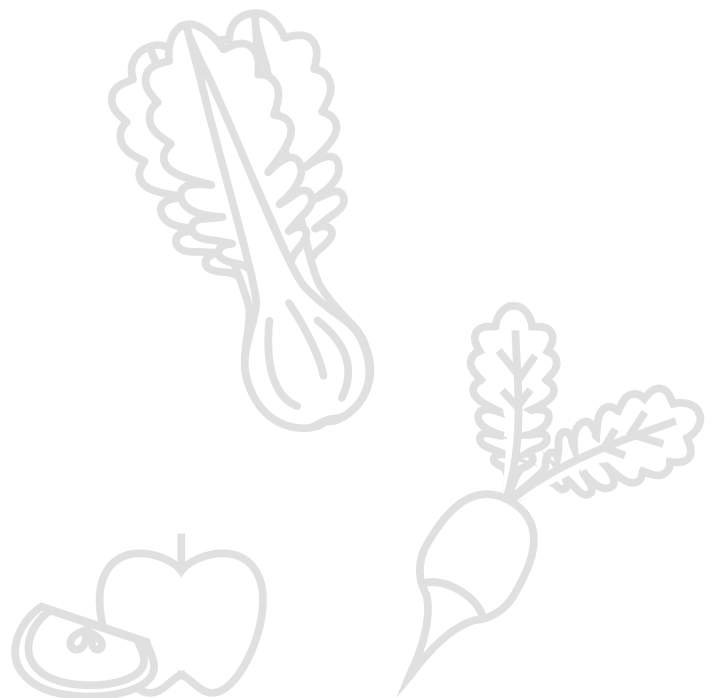
NGSS LS1.A

Structure and Function – All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water and air. Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow.

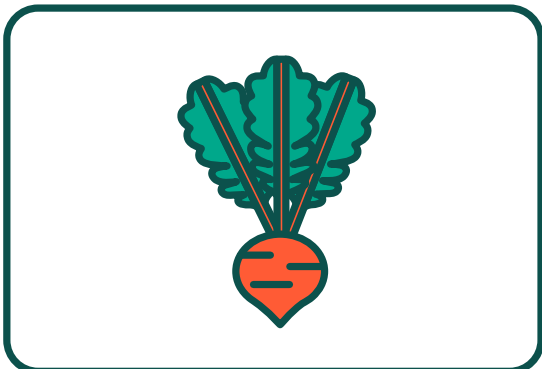
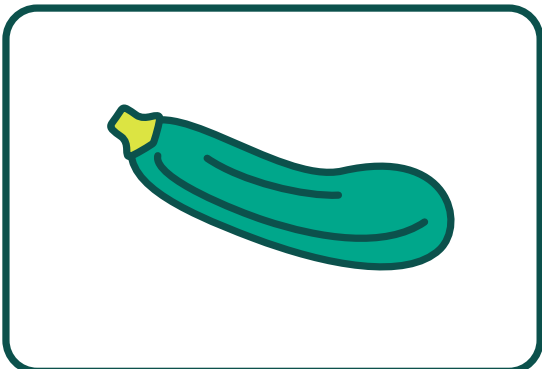
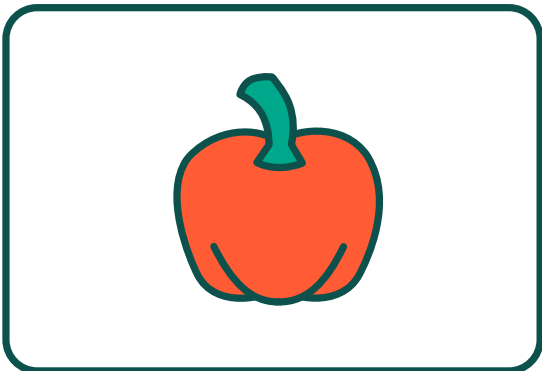
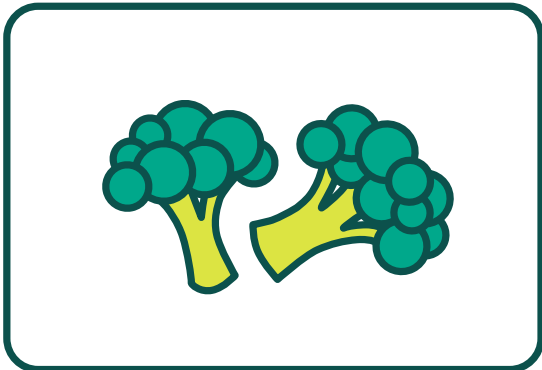
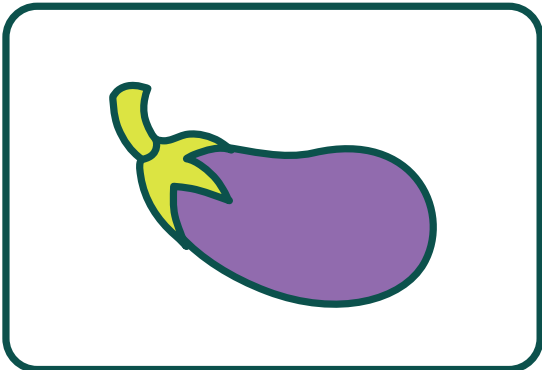
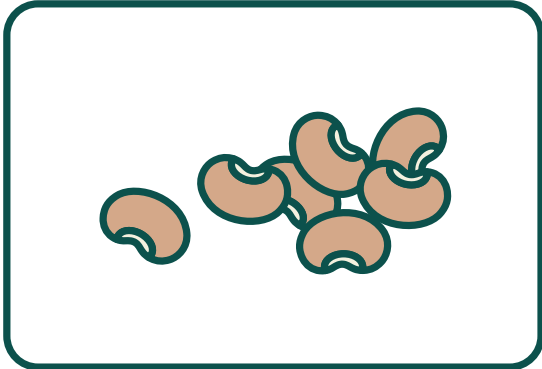
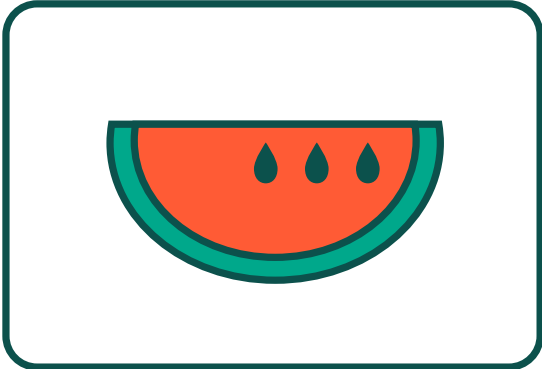
English Language Arts Common Core State Standards

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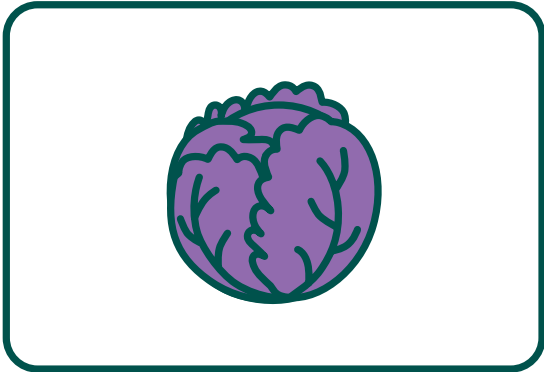
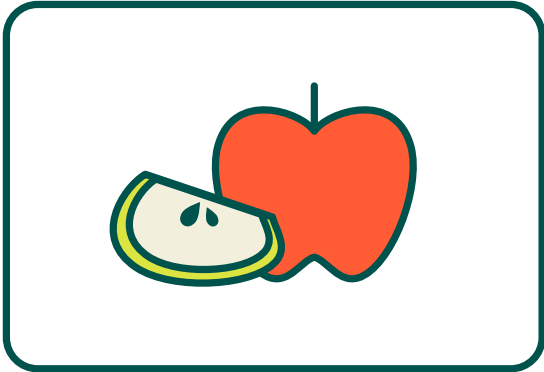
Participate in collaborative conversations with diverse partners *about grade 1 topics and texts* with peers and adults in small and larger groups.



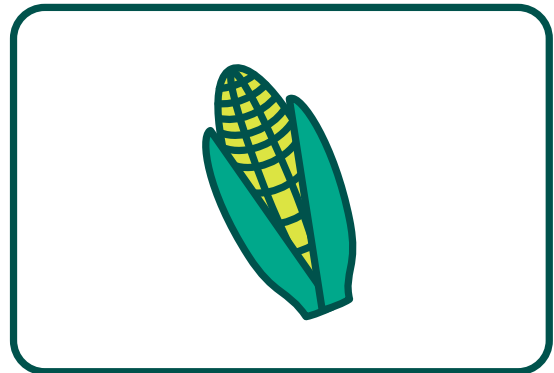
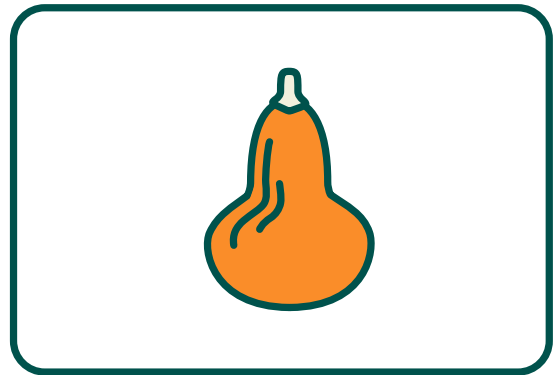
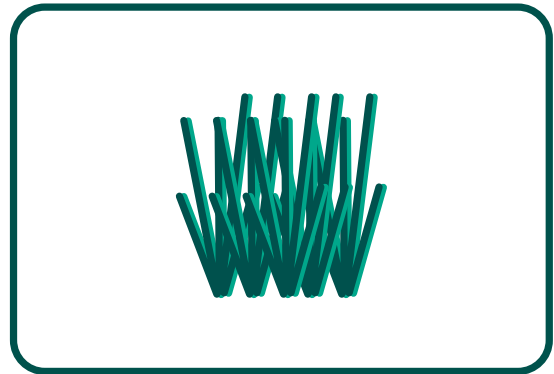
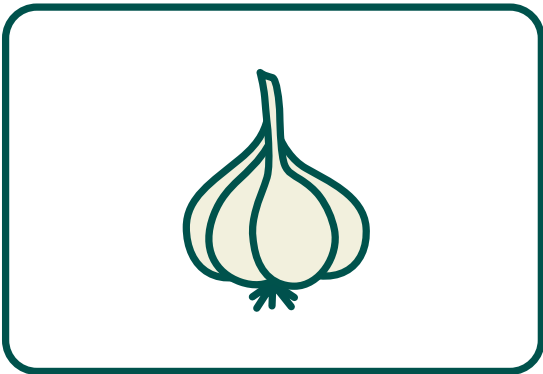
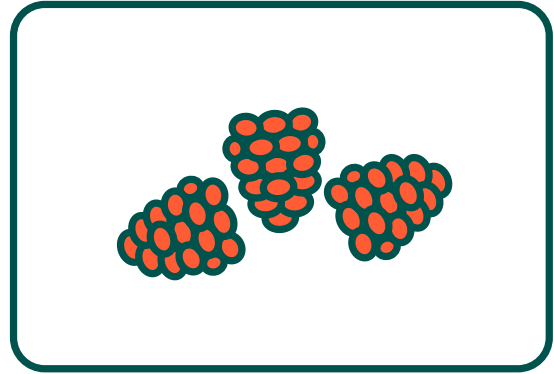
Plant Part Sorting Cards



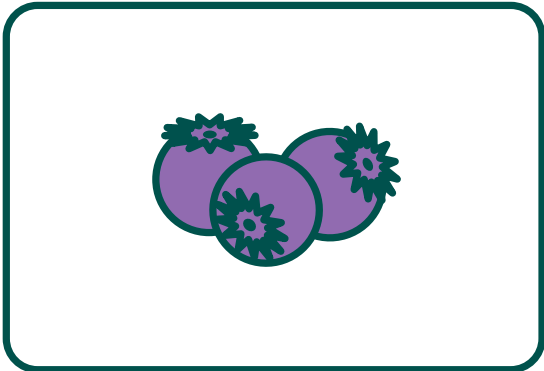
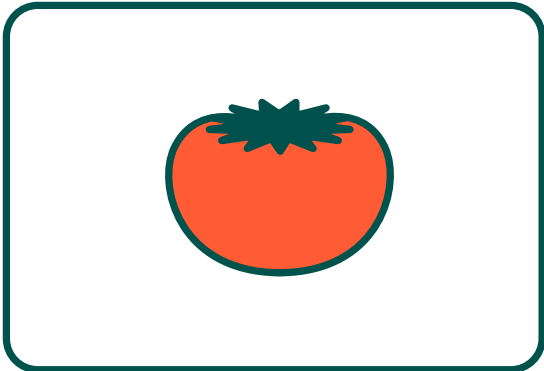
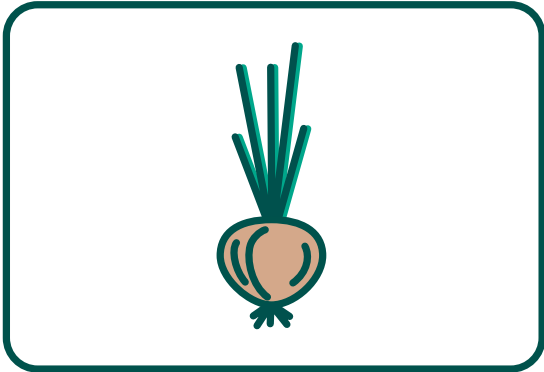
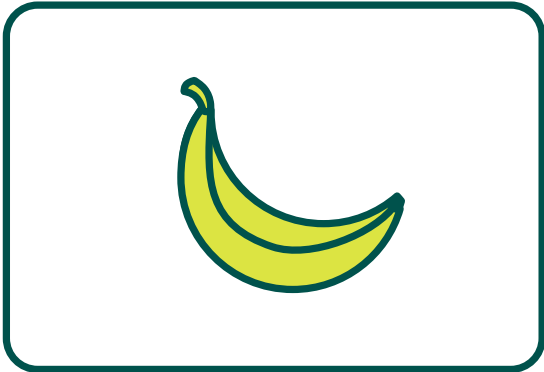
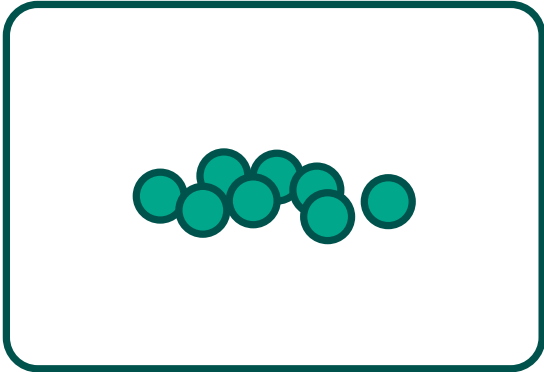
Plant Part Sorting Cards



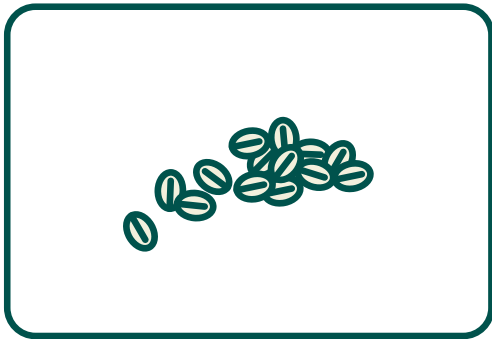
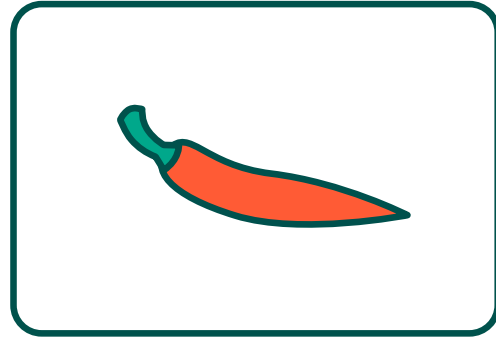
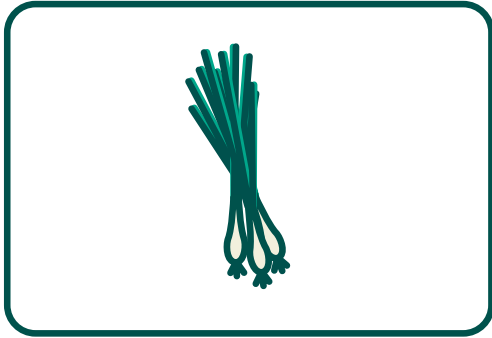
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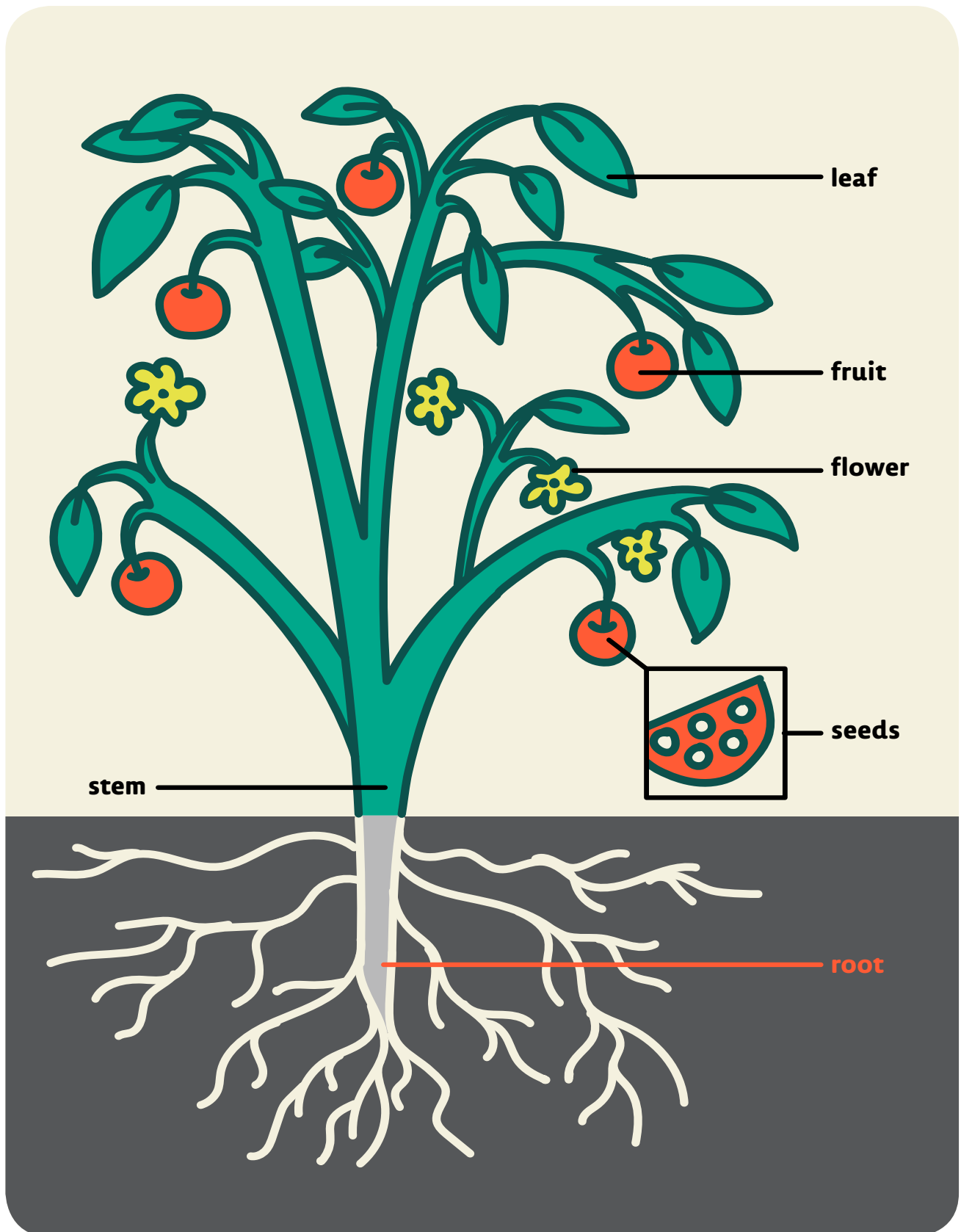
Plant Part Sorting Cards



Plant Part Sorting Cards

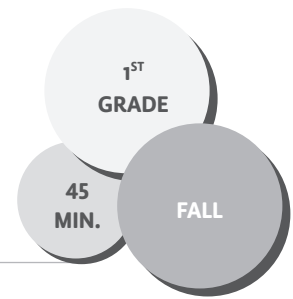


Plant Part Poster



Tea Time

THEME: CONNECTING FOOD, CULTURE, AND COMMUNITY



ESSENTIAL QUESTIONS

How are plants used beyond cooking?
Why is teatime special in many cultures?

LEARNING OBJECTIVES

- ✓ Students will be able to explain how plants can be used as medicine.
- ✓ Students will be able to prepare for a tea party.

LESSON DESCRIPTION

In this lesson, students harvest leaves from the garden to make tea and, while it is steeping, prepare for a tea party! In groups, students gather flowers for bouquets, make centerpieces out of found objects, and thoughtfully set the table for their classmates. The class then enjoys their homemade tea together.

MATERIALS

- Large thermos of hot water
- 2–3 teapots or mason quart jars
- Snack that you make or purchase (preparation below)
- Tablecloths (amount dependent on your number of tables) or picnic blankets if you don't have picnic benches or tables in the garden
- 1 cup for each student (if you use paper cups, you can poke holes in them later and use them as containers in which to start seeds)
- Napkin or plate for each student (can be school paper towels, but you might bring in cloth dinner napkins to make it feel more special)

- 5–7 kid scissors (for cutting flowers and herbs for bouquets with supervision)
- 3–6 vases for flower bouquets (amount dependent on your table setup and preference)
- A couple bus tubs for dirty dishes

PREPARATION

- › Make or buy a simple snack to serve with your tea. If not using one of the recipes on next page, you might choose to buy herby flatbread crackers or a cookie with herbs, such as gingersnaps.
- › Select the herbs that are suitable to make tea in your garden. If your group is large, choose a couple different herbs in different spots in the garden to avoid overcrowding.
- › Investigate the medicinal properties of the herb with which you're making tea to share this information with students.

GARDEN HERB CAN HELP WITH . . .

Chamomile	Sleep and digestion
Feverfew	Headaches
Mint	Digestion
Lemon balm	Stress
Tulsi (holy basil)	Stress, colds, and congestion
Raspberry leaf	Boosting the immune system
Lavender	Relaxation and sleep

Honey Seed Snacks

- 1 cup rolled oats
- 1 cup sesame seeds, plus more for coating
- 1 cup sunflower seeds
- 1 cup honey
- 1 cup nut butter (almond butter or sunflower butter; be sure to check the class allergy list beforehand)
- 1 cup carob powder

Mix oats, sunflower seeds, honey, nut butter, and half of the sesame seeds until it's incorporated. Roll the dough into 1-inch balls or smaller, and then roll in sesame seeds.

Note: ½ cup = equals 8 Tbsp

Herby Flatbread Crackers

- 1 cup whole grain flour (whole wheat, spelt, etc.)
- 1/4 tsp salt
- 2 Tbsp + 2 tsp canola oil
- 1/2 cup water
- Sea salt
- 1 Tbsp rosemary, thyme, or other herb from garden, minced (optional)

Mix flour, salt, and oil with a fork until crumbly and mealy. Add 1/4 cup water, stirring while you add. Switch to kneading by hand when dough gets difficult to mix with a fork. Add water as necessary until dough forms a firm ball. Dough should not be sticky.

ACTION STEPS

1. Engage: Gather students in a circle, and pass around various herbs you've collected from the garden, asking students to smell them. Ask, *Does anyone know any of these plants?* After they've shared, say, *These are all herbs I've collected from the garden. Herbs have a strong scent and taste. You only need a little to taste them in a dish or smell them. (5 min.)*

2. Harvesting Herbs: Remind students how to harvest with two hands, and ask that each student harvest just a little, for example five to ten leaves each, because a little goes a long way. Split students into two to three groups for harvesting, explaining how you'll call them back together and where they'll put their herbs once they return. **(5 min.)**

3. Making Tea: When students return with their herbs, have each student contribute a little piece of herb into your quart jar or teapot, and then cover with hot water from the thermos, making sure students have stepped back from containers for safety. Explain, *The tea needs about fifteen minutes to steep, so in that time we can prepare our table for the tea party. (5 min.)*

4. Preparation Groups: Explain each role to students, and then divide them evenly among the roles to prepare. Consider allowing students to self-select their role. **(10 min.)**

a. Setting the Table: This group will lay out tablecloths, and place a cup and napkin at each table setting.

b. Making Bouquets: This group will cut flowers and herbs from the garden to make bouquets. Be sure to set boundaries for this group, limiting the amount each student can cut.

c. Making Centerpieces: This group will gather natural objects from the garden to create centerpieces.

5. Tea Party: Have students settle into their places. Say to students, *Teatime is a special time in a lot of different cultures around the world. It's a time to slow down and enjoy the moment and the people you're sharing with.* Explain that we won't eat or drink until

everyone has their snack and tea so that we can enjoy it together. Have the classroom teacher or a volunteer pass out a snack to each student while you walk around pouring tea for each student. Encourage students to chat with their neighbors and then discuss the reflection questions as they enjoy their snack and tea. **(10 min.)**

6. Cleanup: Show students where to put their dirty dishes to help clear their setting. **(5 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *Does anyone here drink tea at home? If so, how or why do you drink tea?*
- *How would you describe the flavor of our homemade tea?*
- *If you tried more than one kind of tea, which was your favorite? Why?*
- *What was your favorite part of our time together today?*
- *How can you share making tea with your family and friends at home?*
- *Ask yourself: How did I work with others today to make sure our tea party went well?*

ADAPTATIONS

Inviting Guests: Have students invite their families and/or a buddy class to their tea party!

Sun Tea Variation: Make sun tea with students. Put ½ cup to 1 cup of dried herbs in ½ gallon jars. Fill each jar with cold water, and put a lid on each one. Set in the sun for three to five hours to steep and warm.

Tablecloth Variation: Consider using butcher paper as your tablecloths and having the table setting group draw a flower or other garden-based picture for each table setting.

Bring-Home Extension: Students can create family tea bags to share with their family using a paper coffee filter. Have each student add a handful of dried herbs to a coffee filter, and tie it up with cotton cooking twine. You can even attach a label onto the end of the string using a hole puncher and card stock. Have students write the ingredients on their label. Older students can write a favorite quote or words of inspiration if they'd like. This is a “family tea bag” because they can use it to make a whole pot of tea to share with family or friends.

Compost Tea: Explain to students that a kind way to take care of the garden plants is by serving them tea, Compost Tea! You can find directions on the internet for how to make compost tea, a nutrient-dense, chemical-free fertilizer from your school garden's compost.

Teatime Rituals: With older students, you can emphasize the ritual of tea as a mindfulness practice and/or research teatime rituals from around the world, including Japan's tea ceremonies, England's afternoon tea, Argentina's yerba mate, and India's chai tea.

ACADEMIC CONNECTIONS

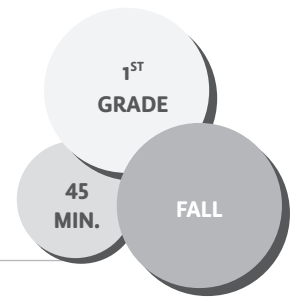
English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.SL.1.1

Participate in collaborative conversations with diverse partners about *grade 1 topics and texts* with peers and adults in small and larger groups.

The Great Balancing Act

THEME: MAKING HEALTHY FOOD CHOICES



ESSENTIAL QUESTION

How can we balance food groups to make a healthy snack?

LEARNING OBJECTIVES

- ✓ Students will be able to identify foods in the various food groups.
- ✓ Students will be able to demonstrate how to make a healthy snack with one or more food groups.

LESSON DESCRIPTION

In this lesson, students practice sorting food into different food groups and learn a healthy snack equation to help them invent food group combinations.

MATERIALS

- MyPlate or Oldways food pyramids for each student
- 1 plate or 1 paper towel for each student
- 2 tubs of spread such as cream cheese or hummus (or slices of cheese)
- Butter knives for the spread
- Crackers, slices of bread, or pita
- Bowl of sliced fruit or vegetable, such as cucumber, apple, or tomato
- 1 Healthy Snack Worksheet for each student (p. 145)
- Food Group Sorting Cards (pp. 146–148)

PREPARATION

- › Photocopy the Healthy Snack Worksheet.
- › Photocopy and cut out the Food Group Sorting Cards.

- › Slice the fruit or vegetable.
- › Portion spread into bowls for groups of 4–6 students.

SNACK IDEAS

Protein or Dairy	Grain	Sliced Fruit or Vegetable
Cream cheese	Whole grain cracker	Cucumber
Hummus	Slice of bread	Tomato
Cheese slice	Pita	Apple
Sunflower butter	Rice cracker	Radish

ACTION STEPS

1. Engage: Ask students, *What do you usually have for a snack when you're hungry?* or *What snacks do you and your family share?* Take responses, then explain that having a snack is great for when you need some extra energy between meals, and today they'll learn how to make a healthy snack. **(5 min.)**

2. Sorting Foods: Provide groups with food pictures, and have them sort the pictures into groups however they'd like. Circulate through the room, and ask students to tell you how they grouped the pictures. **(5 min.)**

3. Explain Food Groups: Pass out copies of MyPlate or Oldways food pyramids, and review each food group as a whole class. Have students sort again by food groups. Circulate through the room, checking for accuracy and asking questions to get students back on

track, such as, *Why are these foods grouped together?* (5 min.)

4. Combining Healthy Snacks: Explain, *Each food group helps your body, and when you make a snack, it's great to have three different food groups together.* Show them the concept as an equation: Protein or Dairy + Fruit or Veggie + Grain = A Healthy Snack! Review the concept of go, grow, glow foods, explaining that the grain is our go food, the protein or dairy is grow food, and the fruit or veggie is our glow food. Now have students combine the food pictures to create a healthy snack. Circulate through the room, asking questions and checking for understanding. (5 min.)

5. Wash Hands Break! (5 min.)

6. Making a Healthy Snack: Explain to students that you're going to create a healthy snack to eat in class, using the healthy snack equation. Assemble a snack in front of students as a model, explaining each step. Spread cream cheese or hummus onto your cracker or piece of bread and then place a slice of your fruit or vegetable on top. Have a couple students help pass out materials for the snack. Remind students to wait until you tell them to eat their snack. If needed, help students with assembly. (10 min.)

7. Tasting: Have students try the snack together. As they finish, have them create more healthy snack ideas using the equation, and share their new snack ideas as a class. Say, *We can't always combine different food groups when we have snacks. Having a fruit or vegetable or dairy or protein by itself is also a great option.* (5 min.)

REFLECTION

Have students discuss the following questions in small groups, then share with the class: (5 min.)

- *What was the grain part of our snack? What was the protein part of our snack?*
- *What would be another tasty vegetable to use for our snack?*
- *How would you make a healthy snack for your friends or family? What three things would it include?*

ADAPTATIONS

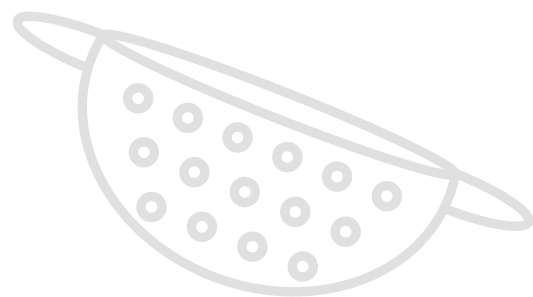
Extension: Have students create and draw an ideal meal incorporating all five food groups. It can be fun to do this on paper plates.

ACADEMIC CONNECTIONS

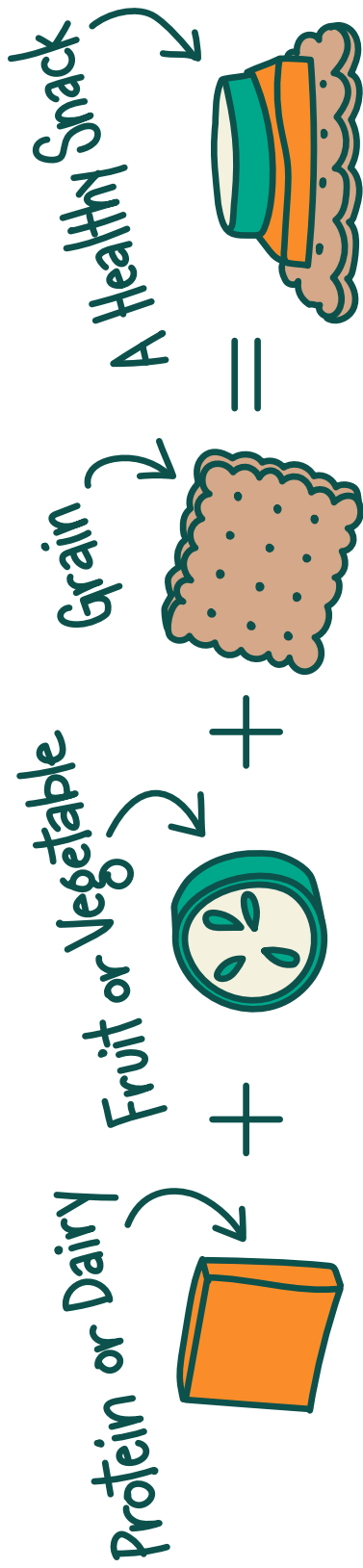
English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.SL.1.1

Participate in collaborative conversations with diverse partners *about grade 1 topics and texts* with peers and adults in small and larger groups.



A Healthy Snack Worksheet

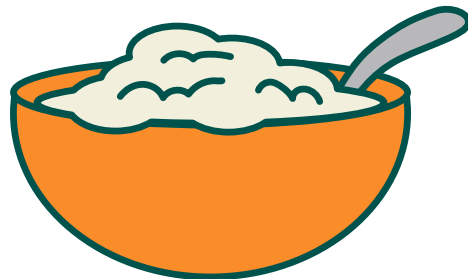
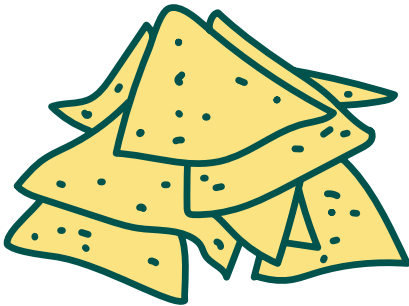
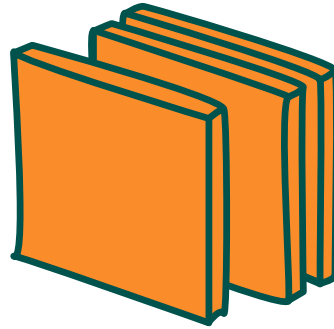
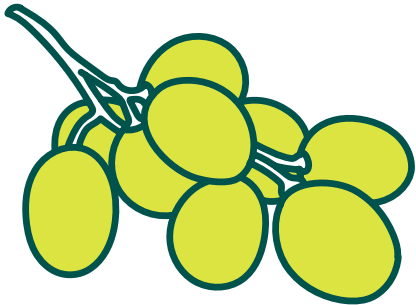
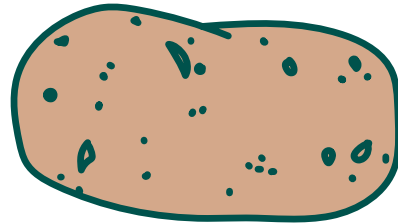
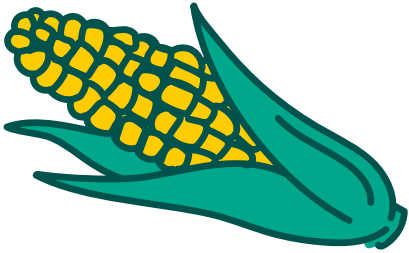


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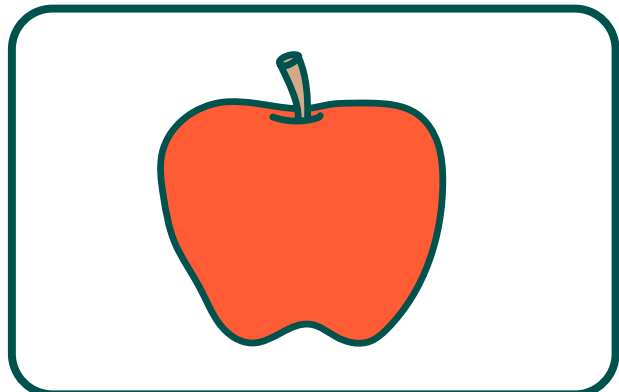
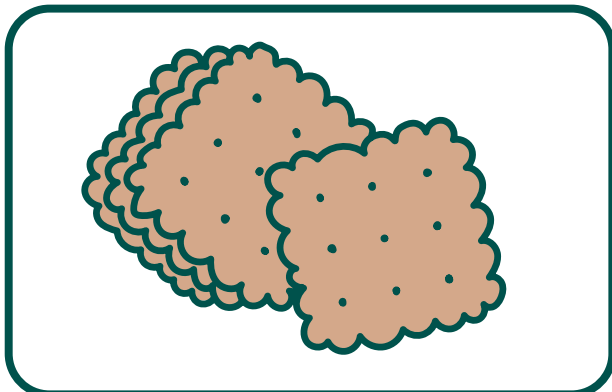
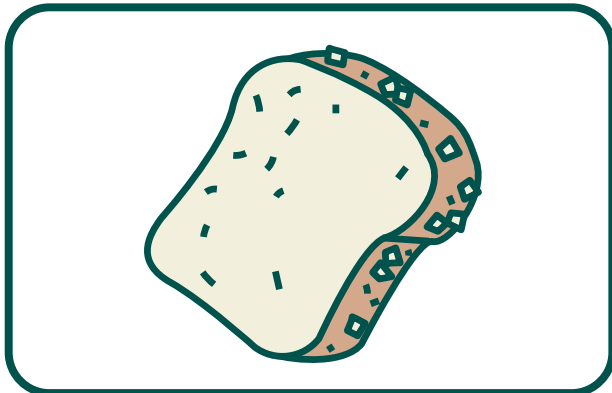
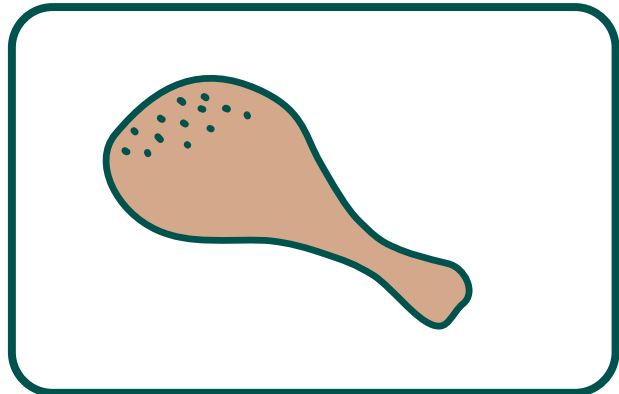
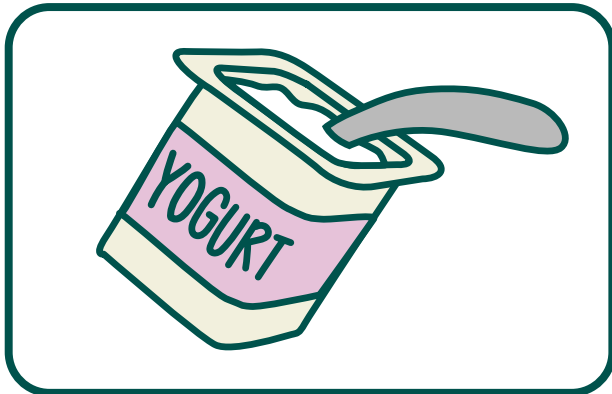
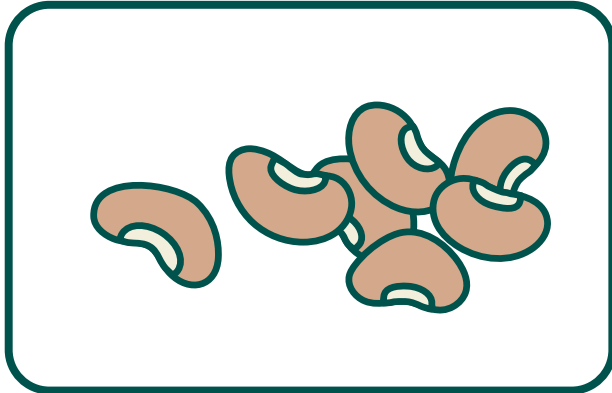
2. _____ + _____ + _____ = _____

3. _____ + _____ + _____ = _____

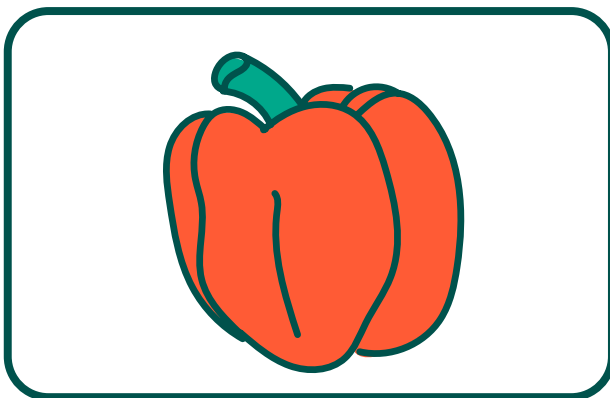
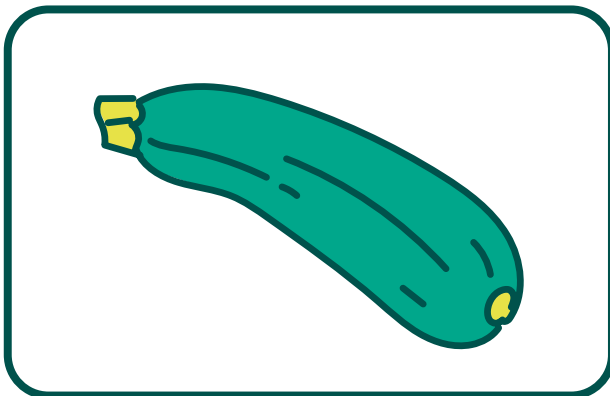
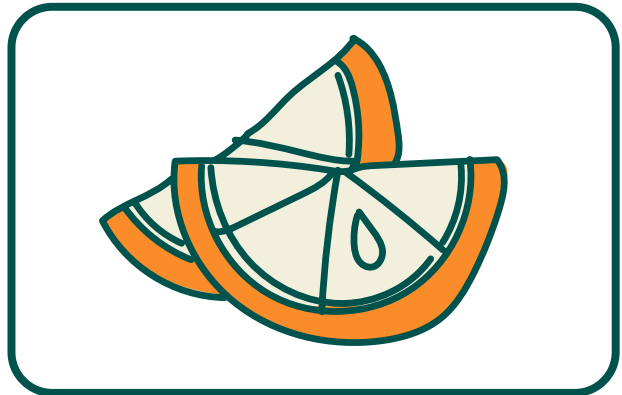
Food Group Sorting Cards



Food Group Sorting Cards

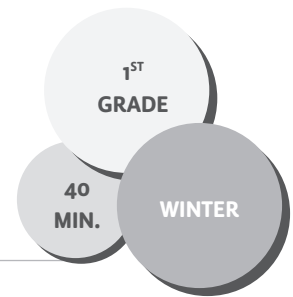


Food Group Sorting Cards



Plant Part Mystery

THEME: EXPLORING THE ECOLOGY OF FOOD



ESSENTIAL QUESTION

Why is each part of the plant important?

LEARNING OBJECTIVE

✓ Students will be able to recognize and name the six plant parts.

LESSON DESCRIPTION

In this lesson, students explore the six plant parts by dressing up a classmate or teacher as a plant, playing a plant part mystery game, and dissecting a plant to identify as many parts as they can.

MATERIALS

■ Bag to hold the props

Materials for Dress-up

- Roots: Brown pipe cleaners, yarn, or mop head
- Stems: Green knee socks or scarves or large piece of butcher paper to wrap around person
- Leaves: Large leaves from the garden, such as rhubarb, or cut-out felt leaves
- Flowers: Fake flowers attached to a headband or a cardboard cutout flower
- Fruits: Real or plastic piece of fruit
- Seeds: Cardboard cut-outs of seeds, small lidded container of seeds (can be used like a maraca)
- 6 mystery canisters (see Preparation below)
- 6 plant parts (roots, stems, leaves, flowers, fruits, and seeds) from edible plants
- Pencils
- Plant Part Mystery Game Worksheet for each student
- Plant for dissection for each group of 3–4 students (see Preparation below)

PREPARATION

- › Collect and create materials for dress-up.
- › Collect coffee tins, shoeboxes, or large tomato cans (without sharp edges); fabric; and rubber bands to create six mystery canisters. Measure and cut squares of fabric to fit over the openings of each container. Create an X-shaped hole in the fabric (for reaching hands through) by folding the square in half and cutting through the middle but not to the edge. Open and fold in half the other way and repeat so that you have cut an X. Center the fabric over the opening, and secure it with a rubber band. Number or color-code the canisters so that they can be told apart.
- › Place one plant part into each container. Be sure to pick items with interesting textures, smells, and sounds because students won't be able to rely on their sense of sight. For example, dry pea seeds make a fun percussive sound in a can, and it's nice to have a fragrant flower or a lemon that students can scratch and sniff.
- › To provide students with plants to dissect, harvest plants from the garden that exhibit as many plant parts as possible. Alternatively, buy cheap flowers from the grocery store that include some greenery for students to dissect.
- › Photocopy the Plant Part Mystery Game Worksheet for each student.
- › Photocopy and cut out plant part labels for students to use during dissection.



ACTION STEPS

1. Dressing Up: Gather students to sit in a circle, and ask for a volunteer to play dress-up standing the middle of the circle. You can dress up the classroom teacher or another adult. Tell students, *We're going to make this person look like a plant. What does this person need at their feet? What grows from the bottom of the plant? When students suggest roots, ask for ideas of what they could use to make the person look like they have roots.* Pull the appropriate prop from your bag after hearing their suggestions, and have the volunteer put it on. Repeat this process with each part of the plant until the volunteer is fully dressed. **(10 min.)**

2. Plant Part Mystery Game: Tell students that you've brought a plant part mystery game. Show them your canisters, and explain that you've placed a plant part in each one. Say, *We'll pass around the canisters, and you'll put your hands inside, and use all your senses except sight to figure out which plant part it is. Maybe you can even name the plant!* Ask students to name the senses they can use. Pass out the Plant Part Mystery Game Worksheet and pencils so that they can keep track of their guesses without blurring them out. **(10 min.)**

3. Explain: Have a big reveal, taking each plant part out of its canister. For each plant part, ask students, *How did you know it was a root? What clues did you use to know it was a stem?* etc. **(5 min.)**

4. Dissecting Plants: Pass out plants to each group of students to dissect at their tables. Provide students with plant part labels, and have them take apart plants and place them beside the corresponding label. Circulate through the room, observing students' categorizing and asking questions to keep them on track. **(10 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- Which plant parts are easy for you to find?
- What clues do you look for to find a root? A stem? A leaf?
- Which plant parts do you like to eat?
- Why is each plant part important?

ADAPTATIONS

Simpler Materials: If you have fewer than eight students, you can do the exercise without the mystery canisters. Place a blanket on the ground, and have students lie on their bellies around it with their hands under it. While they close their eyes, hand one object to a student under the blanket. Now everyone can open their eyes and pass the object around, describing it as they hold it. Once it's made it all the way around, they can guess what it was.

Song: Sing “Roots, Stems, Leaves” by the Banana Slug String Band to review the six plant parts.

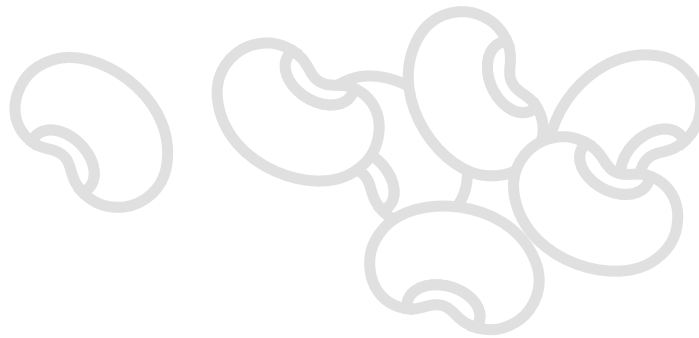
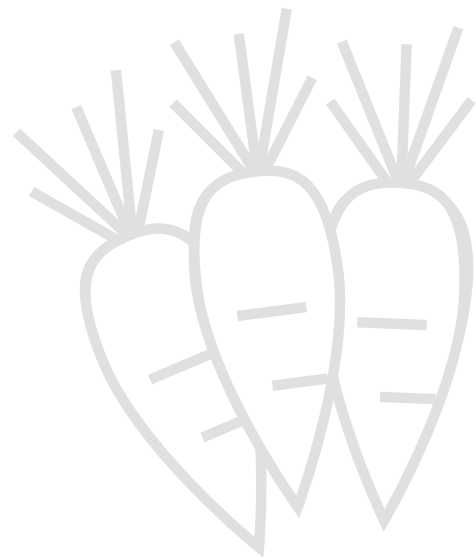
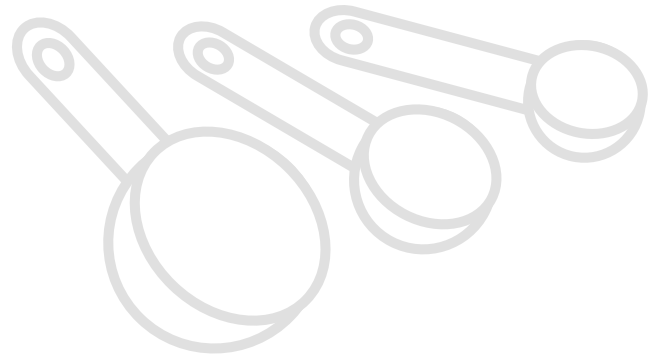
Garden Adaptation: Instead of dissecting plants, you can have students search in the garden and gather examples of each plant part. Before they head out, establish expectations about what is and isn’t okay to pick, particularly when looking for roots!

ACADEMIC CONNECTIONS

Next Generation Science Standards, Life Science Disciplinary Core Idea

NGSS LS1.A

Structure and Function—All organisms have external parts . . . Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow.



Name: _____ Date: _____

Plant Part Mystery Game Worksheet

Directions: Write your guess for each mystery canister to the right of the number.

	Roots Flowers	Stems Fruits	Leaves Seeds
	Your Guess!		
# 1			
# 2			
# 3			
# 4			
# 5			
# 6			

Name: _____ Date: _____

Plant Part Mystery Game Worksheet

Directions: Write your guess for each mystery canister to the right of the number.

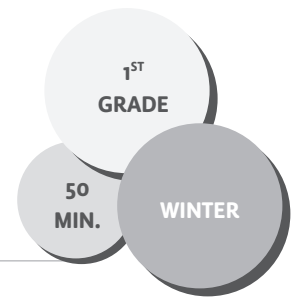
	Roots Flowers	Stems Fruits	Leaves Seeds
	Your Guess!		
# 1			
# 2			
# 3			
# 4			
# 5			
# 6			

Teacher Directions: Cut out for each group of students to use to label during plant dissection.

ROOTS	STEMS	LEAVES
FLOWERS	FRUITS	SEEDS

Root-View Cups

THEME: GROWING AND ACCESSING HEALTHY FOOD



ESSENTIAL QUESTION

What can we learn by observing roots growing?

LEARNING OBJECTIVES

- ✓ Students will be able to sow seeds.
- ✓ Students will be able to make predictions about root growth.

LESSON DESCRIPTION

In this lesson, students learn about the function of roots by setting up their own root-view cups to make observations.

MATERIALS

- “My Roots Go Down” song by Sarah Pirtle
- 12-quart bag of organic seed starting potting mix in a tub for easy cleanup
- 4–6 spoons or small scoops
- 2–3 spray bottles (or small watering cans, if outdoors)
- Fava bean seed packet
- Rainbow chard seed packet (or other culturally appropriate seeds)
- Cordless drill, or nail and hammer
- Tape
- Tray

For each student:

- 18-oz. soft clear plastic cup
- Photocopy of Paper Shield template (more information below in Preparation section)
- Scissors
- 1 sheet of dark-colored drawing paper (e.g., dark blue or green)

- Markers or crayons (and any other art supplies for decorating shields)
- Observation Log (p. 157)

PREPARATION

- › Moisten your seed starting mix so that it’s about as damp as a wrung-out sponge.
- › Draw a template for the paper shield: take one of your clear plastic cups, and cut a straight line from top (lip) to bottom (base). Next, cut out the entire bottom of the cup. Now, unroll the cup, and lay it as flat as possible on a piece of paper. Trace it, adding about one inch to each short end. This is your template for the shield.
- › Make a photocopy of the shield template for each student.
- › Drill three to four holes in the bottoms of the plastic cups for drainage.
- › Create your own root-view cup beforehand to troubleshoot any unforeseen snags and to have as a model to show students (see below for more information on how to do this).
- › Learn the song, “My Roots Go Down” by Sarah Pirtle.
- › Set up a tray with supplies you’ll need for a demonstration.
- › Set up a station where students will sow their seeds. Have a table with the soil and scoops

on one end, then the seeds in the middle, and the spray bottles of water at the other end.

ACTION STEPS

1. Engage: Gather in a circle and ask students, *Do you know the super important part of the plant that stays hidden and works in secret to help the plant?* Once students guess that you're talking about roots, explain, *Today, we're going to make special cups that are going to let us peek at this part of the plant we usually don't get to see!* (5 min.)

2. Singing: Have students stand. Teach them the song, "My Roots Go Down," using hand gestures for showing roots growing down. Teach them a few verses, then take suggestions from students for new verses and movements. Alternatively, to get out some wiggles before making root-view cups, have students role-play a seed sprouting roots. Ask students if they remember what the job of roots is. Discuss how the roots hold the plant in place and gather nutrients and water from the soil. (5 min.)

3. Model: Have your tray of supplies on hand, and walk through how to make a root-view cup. Fill your clear cup with soil, showing students the holes and asking why you made them. Take a couple seeds and place them up against the side of the cup, explaining that putting them there will let us see the roots grow. Show students your completed model cup and ask, *If I want my seeds to sprout and roots to grow, what do I need to do?* Discuss watering and keeping cups in a dark, warm place. Explain that you'll use paper as a shield or curtain that will cover the cup and let the roots grow hidden in the dark. (5 min.)

4. Decorating Paper Shields: With students back at their desks, provide art supplies for decorating paper shields. You can give students the option of drawing what they think the roots or plants will look like once they grow. You might also want to display the names of the plants for students to practice writing. (5 min.)

5. Sowing Seeds: As students are decorating their paper shields, call four to six students up at a time to set up their cups with you. Have students show you their pointer fingers and point to their first knuckle and then their second knuckle on that finger. Explain that if they choose to plant the smaller chard seed, they'll push their seed in just as deep as their first knuckle. If they choose the bean seed, they'll push it in a little deeper, to their second knuckle. Take the cups outside, and guide students in watering so that cups are not over saturated. (15 min.)

6. Finishing Root-View Cups: Once all students have set up their cups, have them clean up their spaces. Pass out tape. To build anticipation, have a countdown as a whole class before you tape the shield closed. Say, *We're going to count down from five, and when we get to one we're going to hide away our seeds so they can do their work in secret. Ready? Five, four, three, two, one!* (5 min.)

7. Tasting: To have students make the connection between the roots they're observing and edible roots, pass a sample of one or two root vegetables for them to taste, such as sliced carrots, radishes, or cooked beets. (5 min.)

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- In how many days do you predict we'll see roots growing?
- What do you predict the bean roots will look like? What do you predict the rainbow chard seeds will look like?
- How often should you water your cup? Record predictions and post near the root-view cups to reference as the roots grow.
- What are the steps we took to make our root-view cups?

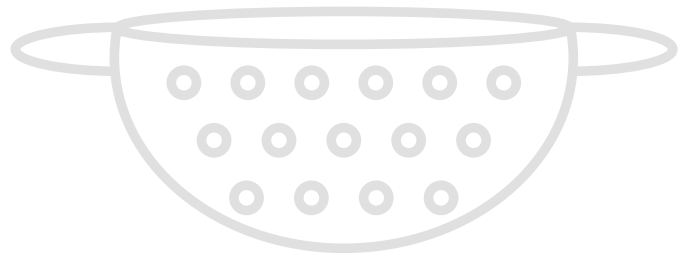
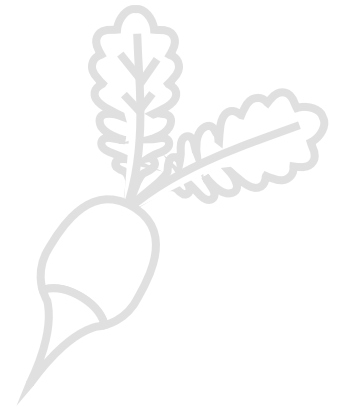
ADAPTATIONS

Follow-up: Have students set up a log where they'll record observations with pictures of the progress of their plants' growth.

ACADEMIC CONNECTIONS

Next Generation Science Standards, Life Science Disciplinary Core Idea

NGSS 1.LS1.A Structure and Function – All organisms have external parts . . . Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow.



Observation Log

Name: _____

Project: _____

Week 1

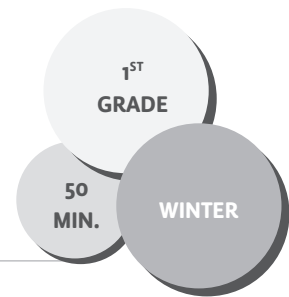
Week 2

Week 3

Week 4

Go, Grow, Glow Quesadillas

THEME: PREPARING HEALTHY FOOD



ESSENTIAL QUESTION

How can we prepare a healthy meal?

LEARNING OBJECTIVES

- ✓ Students will be able to identify go, grow, and glow foods.
- ✓ Students will be able to articulate the importance of incorporating go, grow, and glow foods into their diets.
- ✓ Students will be able to prepare a balanced meal.

LESSON DESCRIPTION

In this lesson, students read a book and learn how to cooperatively make quesadillas with go, grow, and glow ingredients. They practice combining other go, grow, and glow foods to brainstorm other possible balanced meals. This lesson is in conjunction with other first grade lessons Go, Grow, Glow and Plant a Go, Grow, Glow Bed. (Because this lesson involves a hot plate it'd be helpful to have another adult on hand.)

MATERIALS

- *Round is a Tortilla* by Roseanne Greenfield Thong
- Go, Grow, Glow Meal Worksheet (p. 161) for each student
- Crayons
- Hot plate
- Extension cord
- Cheese grater
- Mixing bowl
- Large spoon

- Skillet
- Spatula
- Knife or pizza cutter
- 1 plate for each student
- Salsa for serving (optional)
- Materials for cleanup

Tray with the following for each group of 4–6 students:

- Two large flour tortillas (1–2 packages total)
- Bowl of shredded Monterey Jack or cheddar cheese (about 1 cup per group)
- Bowl of fresh spinach (about 1 cup per group)
- Bowl of pinto or black beans (2 cans total)
- Small mixing bowl
- Serving spoon or spatula for mixing ingredients
- Large plate (for assembling quesadilla)

PREPARATION

- › Photocopy a Go, Grow, Glow Meal Worksheet for each student.
- › Prepare ingredients for quesadillas by grating the cheese and chopping the greens.
- › Set up a station where you can plug in the hot plate to cook the quesadillas.

ACTION STEPS

1. Engage: Gather students in a circle, and read *Round is a Tortilla*. Ask, *What round things did they eat? What things shaped like triangles did they eat?* Once students mention the tortillas and quesadilla, ask, *Who has eaten a quesadilla before? Today we're going to be*

making quesadillas as a class! And we're making a special type of quesadilla—a Go, Grow, Glow quesadilla! **(10 min.)**

2. Model: Show students the flour tortillas, and place one on your plate. Say, *Remember, go foods like this tortilla give us energy. Show me how you go!* Have students enact the gestures you taught them in the fall lesson, Go Grow Glow. Show students your mixing bowl and say, *Next we'll add beans and cheese. Grow foods like beans and cheese have a lot of protein that helps us get strong. Show me how you grow!* And have students show you their muscles. Place the beans and cheese in your bowl, and mix the ingredients. Then show students the leafy greens you've brought and say, *Next, we'll add spinach. Glow foods like spinach help every part of our body from our hair to our heart to our toes stay healthy because glow foods have vitamins and minerals. Show me how you glow!* Explain to students that they should tear the greens into even smaller bite-sized pieces before adding them to the mixture in your bowl. Next demonstrate spreading your mixed ingredients onto your tortilla, pointing out how you leave a ½ inch space along the edge. Finally place the second tortilla on top. Explain, *When we put all these go, grow, and glow ingredients together, we have a balanced meal. We have all the things our bodies need! Now it's your turn to make go, grow, and glow quesadillas.* **(5 min.)**

3. Wash Hands Break! (5 min.)

4. Making the Quesadillas: Have students return to their tables. Pass out trays of ingredients to groups. Tell students that they'll be making their quesadillas in teams, and explain that each group member will get to add one ingredient. Circulate through the room while students are mixing

ingredients and assembling their quesadillas, ensuring they're sharing and leaving room along the edges. Once their quesadillas are built, have one student bring them to the station where the hot plate is set up, and have the other students clean up their spaces. **(10 min.)**

5. Planning a Go, Grow, Glow Meal: Pass out the Go, Grow, Glow Meal Worksheet. While you're cooking the quesadillas, have students work together to fill it out. Explain that they'll choose ingredients for their meal by circling them and then draw the meal with all the ingredients at the bottom of the page. Say, *Your meal might be a pizza, a sandwich, a rice bowl, or even a new quesadilla!* **(10 min.)**

6. Tasting: Once the quesadillas are finished, slice them so that there are as many slices as students in each group. Pass out one quesadilla to each group as well as plates for students. Enjoy together! Ask students to raise their hands if they are going to try to have a go, grow, and glow meal in the next few days. **(5 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *What ingredients did you put into your quesadilla? Which was the go food? Where were the grow foods? Which were the glow foods?*
- *Why is it important that we balance go, grow, and glow foods?*
- *What is a go food you like? What is a grow food you like? What is a glow food you like?*
- *What go, grow, and glow foods might you eat in the next few days?*

ADAPTATIONS

Variation: Instead of quesadillas, try making Go, Grow, Glow Sticks with students, which is described in the *Sprout Scouts Leaders Handbook*. Have students skewer different components onto wooden skewers.

Age: Older students can help prepare the quesadilla ingredients by shredding cheese, chopping vegetables, and making homemade salsa to practice their knife skills.

ACADEMIC CONNECTIONS

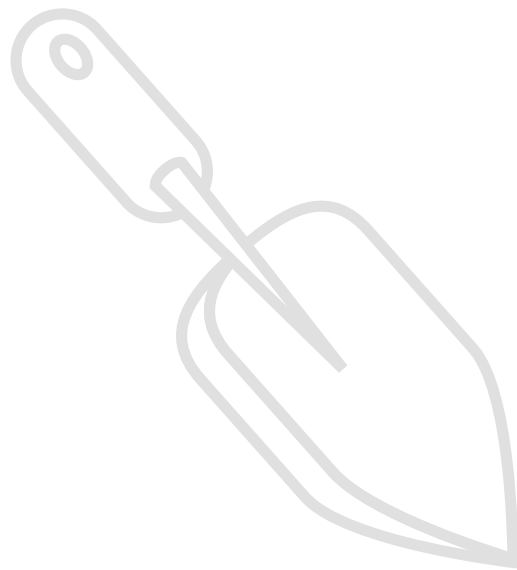
English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.SL.1.1

Participate in collaborative conversations with diverse partners about *grade 1 topics and texts* with peers and adults in small and larger groups.

CCSS.ELA-LITERACY.RL.1.1

Ask and answer questions about key details in a text.



Name: _____ Date: _____

A Go, Grow, Glow Meal Worksheet

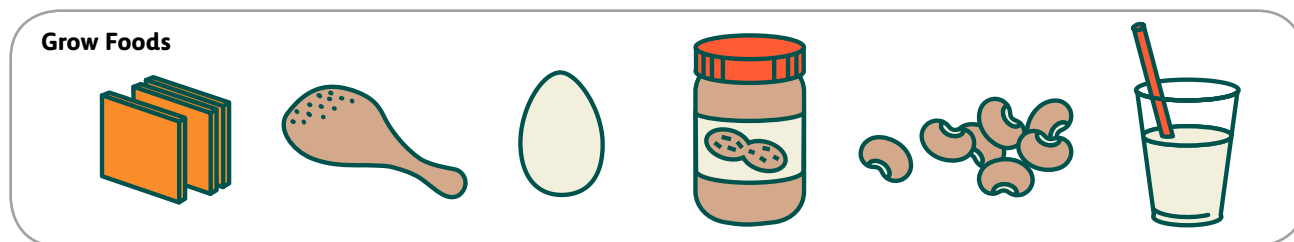
Directions: Circle foods you like in each box to create a Go, Grow, Glow meal!

Circle 1



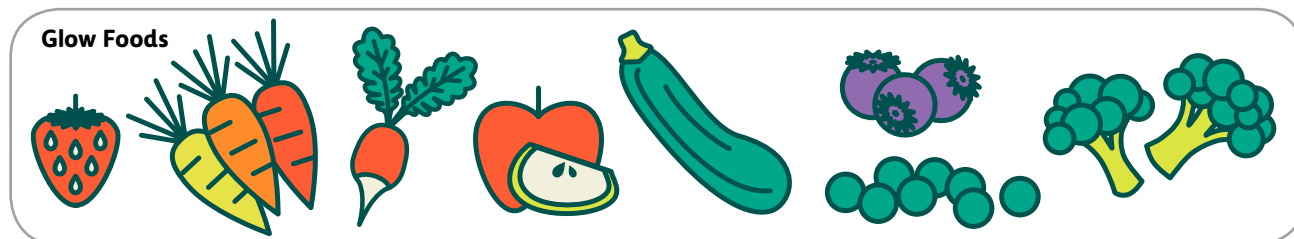
Circle 2

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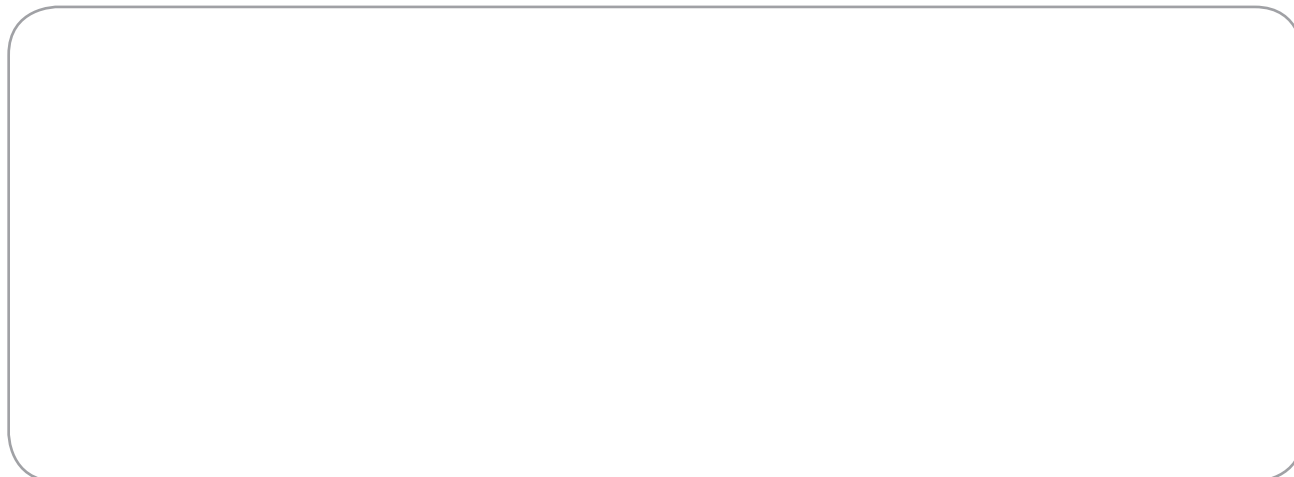


Circle 3

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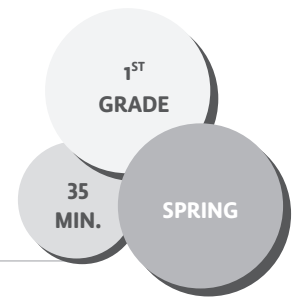


Draw a picture of your go, grow, glow meal: =



Wonders of Water

THEME: MAKING HEALTHY FOOD CHOICES



ESSENTIAL QUESTION

How can we stay hydrated throughout the day?

LEARNING OBJECTIVES

- ✓ Students will be able to explain why it is important to drink water.
- ✓ Students will be able to set goals for staying hydrated.

LESSON DESCRIPTION

In this lesson, students observe plants that have been sufficiently and insufficiently watered to open up a discussion about the importance of hydration. They role play being a dehydrated plant and then a dehydrated person before setting personal goals for how much water they drink each day.

MATERIALS

- Potting mix
- 2 medium-sized pots
- 2 plant starts (such as collards)
- 1 cup for each student
- Chart paper and markers or classroom board
- Water Log Worksheet (pp. 164–165) for each student

PREPARATION

- › A week or so in advance, prepare two different plants to show the effects of watering. For example, you might have two small potted kale plants, one you've been consistently watering and one you haven't.

- › Photocopy the Water Log Worksheet for each student.

ACTION STEPS

1. Engage: Gather students in a circle, and show them the two different plants you've prepared. Ask them to make observations with a neighbor. Say, *These are the same plants, but what do you notice is different about these two plants?* Have students share observations and then discuss the signs of dehydration in plants. If they don't mention it, add in the following: *When plants haven't had enough water, their stems will start to droop, and their leaves will start to wilt. Then they'll turn yellow and eventually dry up. (5 min.)*

2. Role Play: Have students stand up in the circle. Say, *Stand like you're a tall, well-hydrated plant. Show me your leaves and your flowers. Now pretend it's been a week of really hot days with no rain, and your gardener hasn't come by to water you. What are you going to start to look like?* Have students show their drooping stems and wilting and shriveling leaves. Then have students sit down again and say, *When a living creature hasn't had enough water, we say that the creature is dehydrated.* Have students repeat the word and then ask students, *What is it like when a person is dehydrated? How is it similar to a plant?* Have students role play being a person who hasn't had enough water. Then pass out cups of water to each student. Say,

When a creature has had the water they need, we say they are hydrated. Show me how you feel after you drink a glass of water, and you are hydrated. Have students act out what they think it looks like to be well hydrated. **(5 min.)**

3. Explain: Say, *Did you know our bodies are mostly made up of water? It's important to drink water throughout the day for us to do all the fun and important activities we do. Drinking water helps our bodies feel energetic and our brains think better!* Ask students to think back throughout the day to all the times they drank water, and have them share with a partner. Then as a class, brainstorm good times to drink water each day. Your list might include: when you wake up, with breakfast, during a morning break, at lunch, after P.E. or other exercise, during an afternoon break, when you get home from school, with a snack, at dinner, or before bed. **(10 min.)**

4. Setting Goals: Pass out the Water Log worksheet, and have students set a goal for when and how many cups of water they'd like to have per day by writing in the cups when they'll drink water each day. They'll use this worksheet to monitor their progress throughout the week. **(10 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- How are plants and animals similar? What do they both need?
- How does your body feel when you don't drink enough water?
- Why is it important to stay hydrated?
- Ask yourself: When do I drink water? When could I drink more water?

ADAPTATIONS

Conservation Extension: Teach students about efficient watering in the garden. This activity can also be a bridge to discussing how to conserve water at home and in their daily lives.

At Home: Have students track the amount of cups of water they have per day (and when) with their families.

ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.W.1.8

With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.



Name: _____ Date: _____

Water Log Worksheet

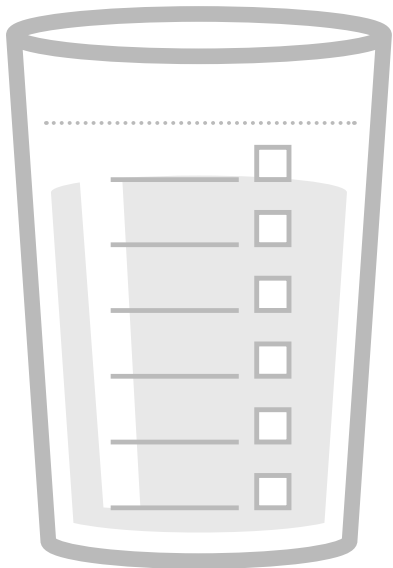
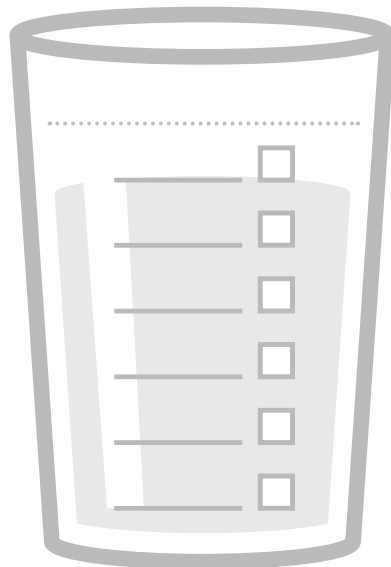
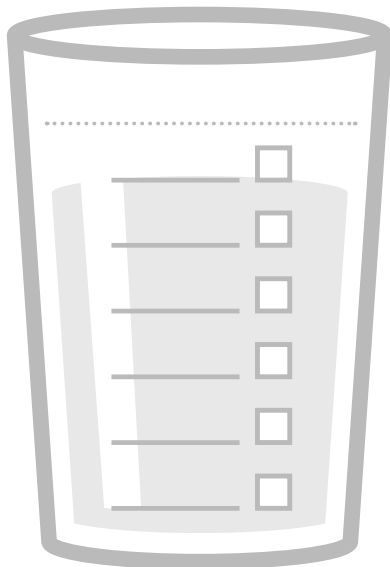
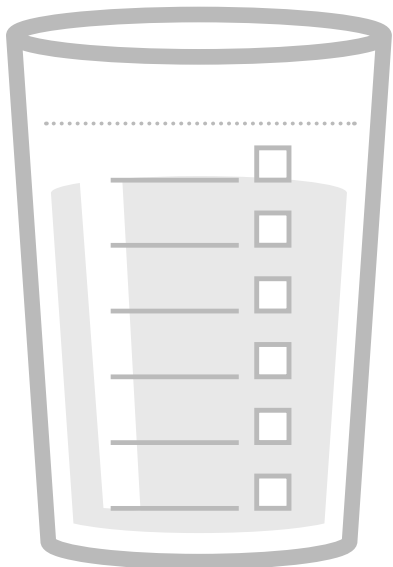
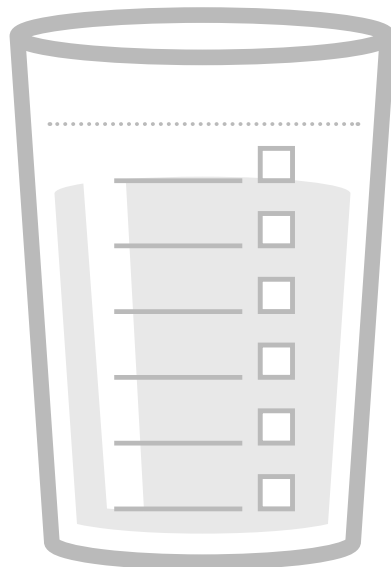
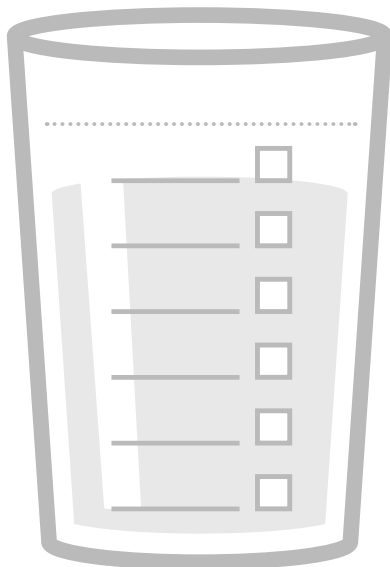
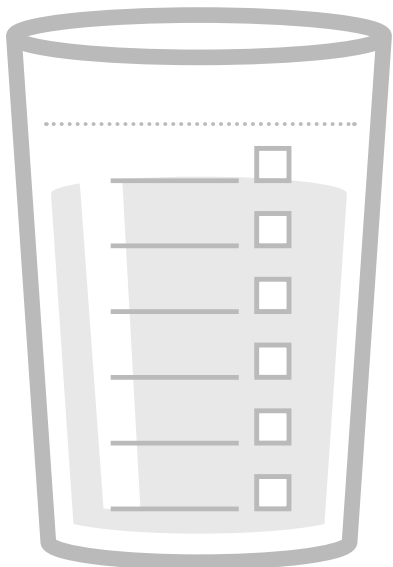
Directions: Write six times in the day when you want to drink a cup of water. Write one time in each cup. Put a check mark for each day you remember to drink at that time.

EXAMPLE:

Day: Tuesday

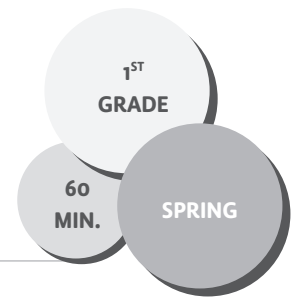
When I wake up

It's important to drink water because _____



Imaginary Plants

THEME: EXPLORING THE ECOLOGY OF FOOD



ESSENTIAL QUESTION

How can we create our own imaginary plants?

LEARNING OBJECTIVES

- ✓ Students will be able to identify the six parts of the plant and their basic functions.
- ✓ Students will be able to apply their knowledge of the six plant parts to create their own imaginary plant.

LESSON DESCRIPTION

In this lesson, students review the six plant parts by creating their own imaginary plant through drawing and collage. They then label plant parts and their functions and share their creations with partners.

MATERIALS

- “Roots, Stems, Leaves” song by the Banana Slug String Band
- About 10 pictures or real-life examples of unusual plants such as Venus fly trap, air plant, blossoming cactus, etc.
- Construction paper
- Plant Part Functions Worksheet for each student
- Materials for collage, such as gardening magazines and seed catalogs
- Glue
- Scissors
- Markers, crayons, and colored pencils
- Library books with photographs of plants to spark inspiration (optional)
- Clock/timer for sharing time

PREPARATION

- › Photocopy the Plant Part Functions Worksheet for each student.
- › Make your own imaginary plant (see #4 under Action Steps below) as a model for the class.
- › Set up a gallery walk, but instead of hanging pictures on the wall, display sets of pictures of unusual plants at tables around the room. Groups of students can rotate to look at the pictures (or real plants) at each table.
- › Display the Guiding Questions for sharing on the board or on chart paper.

PLANT PART FUNCTIONS

PLANT PART	WHAT IT DOES
ROOTS	Take water from the soil Hold the plant in place
STEMS	Support the plant Carry water to the leaves
LEAVES	Make food for the plant with sun and air
FLOWERS	Make pollen, seeds, and fruit
FRUITS	Protect the seeds
SEEDS	Grow into new plants

GUIDING QUESTIONS FOR SHARING

1. What is the name of your plant?
2. What do you like most about this plant?
3. Where in the world does your plant grow?

ACTION STEPS

1. Unusual Plants Gallery Walk: Gather students in a circle and tell them, *Today you'll get to create your very own imaginary plant!*

Explain that you have pictures of some of the unusual plants we find in nature. Have students rotate through viewing each of the unusual plants. Use a timer and a signal, so they know when it's time to switch to a different table. Have students return to the circle and have them share with a neighbor about their favorite plant they saw and why they liked it. **(10 min.)**

2. Singing: Review the parts of the plant by singing "Roots, Stems, Leaves." **(5 min.)**

3. Model: Tell students, *You can be creative because there are millions of different kinds of leaves, flowers, and fruits. You just have to make sure that your plant has all six plant parts: roots, stems, leaves, flowers, fruits, and seeds.* Show students your model, pointing out different features, for example, *The root of my plant is like a carrot, and it's very tasty. The stems of my plant are vines that could climb a fence!* Model using your imagination to get students in the spirit. Tell them they can draw each plant part, cut out images of plant parts from magazines, or do both. **(5 min.)**

4. Making Plant Collages: Pass out art supplies and collage materials to students. Circulate through the room, and ask students

to show you which plant part they're working on. Offer guidance and encouragement where needed. You may want to set up a library corner with books of botanical drawings and photographs of interesting plants that students can visit for inspiration. **(15 min.)**

5. Identifying Parts and Functions: As students are finishing their plant creations, pass out the Plant Part Functions Worksheet. Show them how you used the Worksheet to label each plant part, and show what it does on your own imaginary plant model. Have them cut and glue the names and functions next to the appropriate plant part. If your students need more structure and support, you can do this as a whole class. Using a document camera, if you have one, move step by step through pasting each plant part name and function onto their plants. For example, you would say, *Let's all find the stem of our plant. Now point to the word that says "stem" on our Worksheet. Great! Let's cut out the word "stem" and the words that describe what it does—"carry water to the leaves"—and glue that next to the stem.* **(10 min.)**

6. Sharing: Have students clean their spaces and get into pairs. Then review the guiding questions they will share with their partner. With a student as your partner, model how to share. Demonstrate answering the questions enthusiastically and in full sentences, and show active listening while your partner shares. Tell students that you'll set a timer, and they'll each have three minutes to share. **(10 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- Which plant part holds the plant in the ground? Which plant part can grow into a whole new plant? Which plant part holds the seeds?
- What's one thing you learned about your partner's imaginary plant?
- How did you decide what kind of plant to make?
- What were some of the most creative plants you saw in class today? Why is creativity important?

ADAPTATIONS

Age: Older students will enjoy playing Exquisite Corpse, a game in which players make a collective drawing without seeing what the person before them has drawn. Traditionally this was done with three different people drawing the head, torso, and legs of a being. But it works just as well with plants! Fold a paper into equal sections, and have one person draw the roots, extending their lines just past the fold, so the next person can pick up where they left off and create the stem, and so on. After each player has had their turn, unfold to reveal your beautiful hodgepodge of a plant!

Extension: Read Paul Fleischman's *Weslandia*, a book about a boy who plants his own imaginary staple crop in his backyard and builds a civilization around it.

ACADEMIC CONNECTIONS

Next Generation Science Standards, Life Science Disciplinary Core Idea

NGSS 1.LS1.A

Structure and Function – All organisms have external parts . . . Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow.

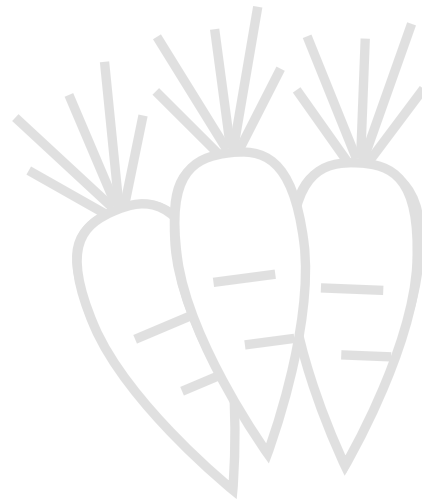
English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.SL.1.1

Participate in collaborative conversations with diverse partners about *grade 1 topics and texts* with peers and adults in small and larger groups.

CCSS.ELA-LITERACY.SL.1.6

Produce complete sentences when appropriate to task and situation.



Plant Part Functions

ROOTS

- › Take water from the soil
- › Hold the plant in place

STEMS

- › Support the plant
- › Carry water to the leaves

LEAVES

- › Make food for the plant with sun and air

FLOWERS

- › Make pollen, seeds, and fruit

FRUITS

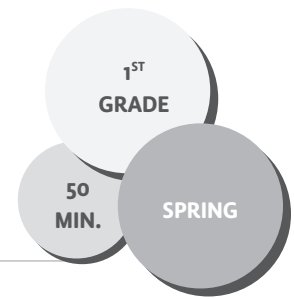
- › Protect the seeds

SEEDS

- › Grow into new plants

Plant a Go, Grow, Glow Bed

THEME: GROWING AND ACCESSING HEALTHY FOOD



ESSENTIAL QUESTIONS

How can eating certain foods help our bodies grow strong and stay healthy?

Where do go, grow, and glow foods come from?

LEARNING OBJECTIVES

✓ Students will be able to recall how different foods help us be active (go), grow strong (grow), and stay healthy (glow).

✓ Students will be able to trace go, grow, and glow foods back to plants and animals that eat plants.

✓ Students will be able to prepare and plant a bed with go, grow, and glow foods.

LESSON DESCRIPTION

In this lesson, students review go, grow, and glow foods through tasting and dramatically acting out each food's impact on the body. They then plant a go, grow, and glow bed of grains (go food), a protein-rich plant (grow food), and a vitamin-rich fruit or vegetable (glow food). Students also hunt for these foods through a go, grow, and glow scavenger hunt. This lesson is designed to be taught in conjunction with fall lesson, Go, Grow, Glow and winter lesson Go, Grow, Glow Quesadillas.

MATERIALS

- Seeds or transplants to represent each go, grow, and glow category
- Images of animals or protein-rich plants and/

or props such as animal figurines (optional, if you don't have protein-rich plants growing in garden)

- Snack (ideally from the garden) such as a cherry tomato, piece of kale, or berry for each student.
- 5 garden trowels
- 5 watering cans
- Access to hose (to refill watering cans)
- Clipboards
- Colored pencils
- Go, Grow, and Glow Scavenger Hunt Worksheet (p. 173)

PREPARATION

- › Consult a local planting guide for your region and determine what you'll be planting.
- › Scout a location in your garden to make your go, grow, and glow bed. You might want to divide a raised bed into three sections.
- › Recruit one or more additional adults (a teacher, parent volunteer, or community member) to support the class during this lesson.
- › Identify a garden chore students can perform as one of the rotations. For example, you might identify a bed that needs weeding, have students harvest a crop for the cafeteria, or set up a wheelbarrow with a screen for students to sift compost. With this age group, most chores will require additional adult supervision.
- › Photocopy the Go, Grow, and Glow Scavenger Hunt Worksheet for all students.

GO! WARM-WEATHER GRAINS

- Spring hard red wheat
- Millet
- Quinoa
- Corn
- Barley
- Buckwheat

GROW! PROTEIN-RICH PLANTS

- Sunflowers (for seeds)
- Pumpkins (for seeds)
- Black-eyed peas
- Beans

GLOW! FRUITS AND LEAFY GREENS

- Tomatoes
- Peppers
- Zucchini
- Chard
- Spinach
- Kale

ACTION STEPS

1. Engage: Gather students in a circle and ask, *Where does the food we eat come from?* Discuss how our food comes from plants and animals that eat plants. Say, *Today we're going to be planting go, grow, and glow foods. (5 min.)*

2. Tasting and Role Play: To help students recall the go, grow, and glow concept, have them do a dramatic representation of eating each of those foods. Pass out a cracker, explaining, *This is a go food, so it gives us lots of energy.* Have them leapfrog or hop around the circle back to their spots. Next pass out a couple sunflower seeds to each student and say, *Seeds, nuts, beans, and meat are grow foods. They help us grow bigger and help us build muscle. Let's pretend we have strong muscles and are lifting heavy things above our heads.* Model lifting an imaginary box, exaggerating the heaviness of the box. Again have students "carry" their box around the circle back to their spots. Finally, pass out a cherry tomato, a piece of kale, or a berry to each student. Say, *This, like other fruits and vegetables, is a glow food. They help us be our glowing healthy selves! Show me what you look like when you're feeling good!* Have students strut around the circle back to their spots. **(10 min.)**

3. Rotations: Briefly go over each rotation with students, explaining that they'll switch once they hear the signal from you. Divide students

into three groups, naming each one Go, Grow, and Glow for easy identification. Have students rotate through each station for ten minutes each. **(30 min.)**

a. Planting: Have each group plant one of the categories of foods. Go over tool safety with each group, and demonstrate how to transplant the starts or sow the seeds that the group will be planting. If using starts, you might have pairs plant together. Have students water their seeds.

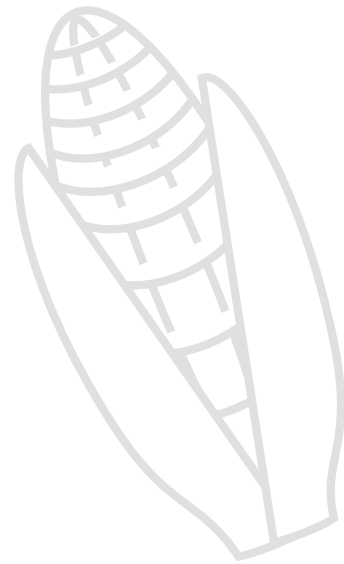
b. Scavenger Hunt: Have students find a representation of go, grow, and glow foods in the garden through a Go, Grow, and Glow Scavenger Hunt. If you don't have any protein-rich plants growing, you might scatter animal figurines or images of protein-rich plants throughout the garden for students to find. You might also highlight a walnut or other nut tree growing in your garden with a sign.

c. Garden Chore: Have the third rotation of students care for the garden in some way, either through weeding, sifting compost, or harvesting a crop. Before students break into smaller groups, be sure to explain the guidelines for this task.

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- What are some go foods you like to eat? What about grow foods? Glow foods?
- What will you tell your caregivers about what you learned about go, grow, and glow foods?
- What go, grow, and glow plants did you find in the garden?
- Ask yourself: Was I safe in the garden today?



ADAPTATIONS

Tasting Extension: If you have lots growing in your garden, harvest crops to make a go, grow, and glow salad with your group.

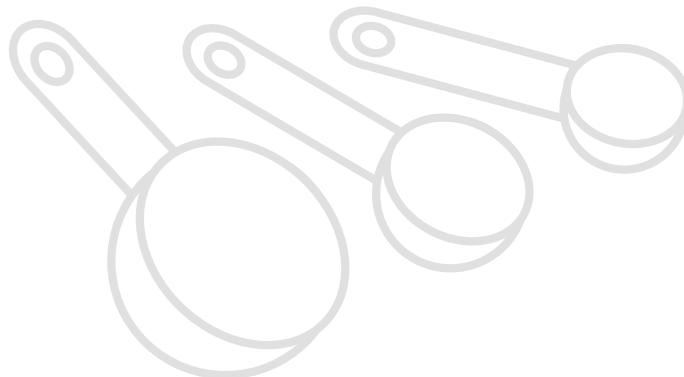
Art Extension: Create go, grow, and glow plant markers, and have students place them next to corresponding plants in the garden.

ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.SL.1.1

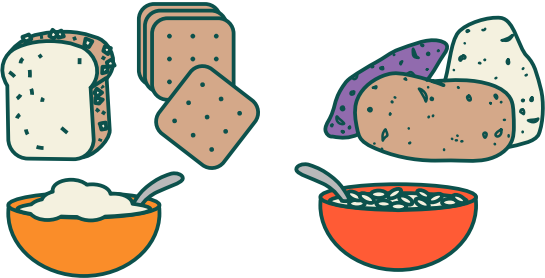


Participate in collaborative conversations with diverse partners about *grade 1 topics and texts* with peers and adults in small and larger groups.



Name: _____ Date: _____

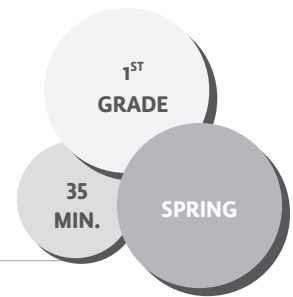
Go, Grow, and Glow Scavenger Hunt Worksheet

Directions: Circle the go, grow, and glow foods you find in the garden.
Then draw a picture of what you find.

GO	
	
GROW	
	
GLOW	
	

Tops and Bottoms Popsicles

THEME: PREPARING HEALTHY FOOD



ESSENTIAL QUESTION

How can we create a healthy snack using lots of fruits and vegetables?

LEARNING OBJECTIVES

- ✓ Students will be able to identify the different parts of a plant.
- ✓ Students will be able to prepare a healthy snack.

LESSON DESCRIPTION

In this lesson, students make Tops and Bottoms popsicles, which include a fruit, root, and leaf part of plants. This lesson is designed to be taught in conjunction with fall lessons, Plant Part Scavenger Hunt and Planting a Tops and Bottoms Bed.

MATERIALS

- Access to a freezer
- Blender
- Extension cord
- Ingredients for popsicles (see recipe below)
- Whole-food example of each ingredient, if possible

For each student:

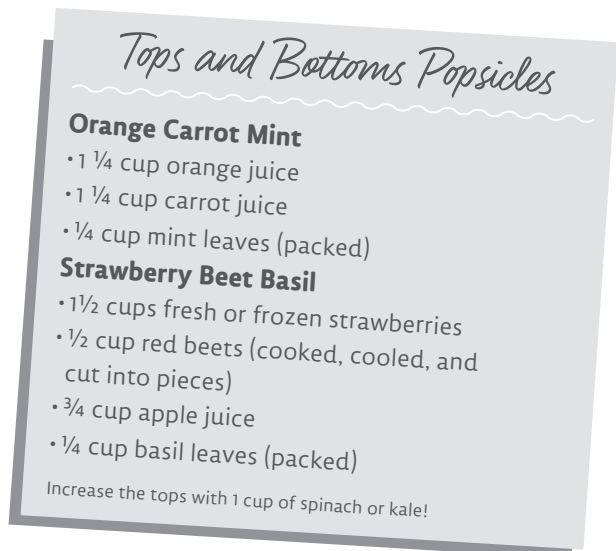
- Popsicle stick
- Small paper cup

For each group of 4–6 students:

- Bowl of herbs on stem or greens
- Bowl for finished product
- Markers
- Masking tape
- Materials for cleanup

PREPARATION

- › Check in with school staff to find a place where you can freeze popsicles.
- › Schedule a time for the classroom teacher to return, at least three hours after the activity (once popsicles have fully frozen), to taste the popsicles with the class.
- › Boil beets, if using, until you can easily poke a fork through them.
- › Portion your herbs or greens into bowls for each group of students.
- › Set up a station with your blender and other ingredients close to a power outlet where all students can see you.



ACTION STEPS

- 1. Engage:** Gather students in a circle and ask, *What are your favorite flavors of popsicles?* When students respond with types of fruit,

Say, *Did you know that strawberry, orange, and grape are all the fruit part of plants? Today we're going to make our own popsicles that include even more parts of the plant. The tops and the bottoms!* Ask students to recall the story *Tops and Bottoms* and other activities they've done on this topic. **(5 min.)**

2. Identifying Plant Parts: Show students the whole-food ingredients for your popsicles and ask, *Is this a top, bottom, or fruit?* As students answer, arrange the produce so it's categorized by plant part. Continue with each ingredient. **(5 min.)**

3. Wash Hands Break! (5 min.)

4. Preparing Herbs: Model for students how to pick herbs off the stem, or tear greens into smaller pieces, and then pass out herbs or greens and bowls to groups. If you're using two different recipes, each group will have a different herb or green. Circulate through the room, ensuring each student is getting an opportunity to contribute. **(5 min.)**

5. Making the Popsicles: Direct students' attention to where you've set up the blender. As you add each ingredient to the blender, ask, *What part of the plant is this ingredient?* Have a student volunteer pass out popsicle sticks and cups, and have students write their name on one end of their stick with a marker. If there is extra time, you might also have students decorate their cups. Once you've blended the ingredients, walk around the room pouring the popsicle mixture into each student's cup. If you've made two recipes, ask students which they think they'll prefer. **(5 min.)**

6. Tasting: Return the popsicles to the class at the time you've arranged with the teacher. **(5 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *What parts of the plant can you taste in our popsicles?*
- *What words would you use to describe the flavors of our popsicles?*
- *Why do you think it's healthy to have three different parts of the plant in our popsicles?*
- *What other ideas do you have for ingredients to put in *Tops and Bottoms* popsicles?*

ADAPTATIONS

Garden Setting: Harvest from your *Tops and Bottoms* bed for your popsicle ingredients.

Song: Sing "Roots, Stems, Leaves" by the Banana Slug String Band.

Cooking Variation: Make a *Tops and Bottoms* salad. Have students discuss the plant part of each food they are putting in their salad and what dressing ingredients make sense to bring out the flavors in their plant part salad. Encourage students to think about the parts of plants they eat during their meals and snacks.

Sharing: Work with your students to prepare a presentation for another class. Then make a double batch of popsicles, and invite your students to arrange a time to deliver the popsicles to another class. At that time, you can read *Tops and Bottoms* to the other class, and your students can act it out.

ACADEMIC CONNECTIONS

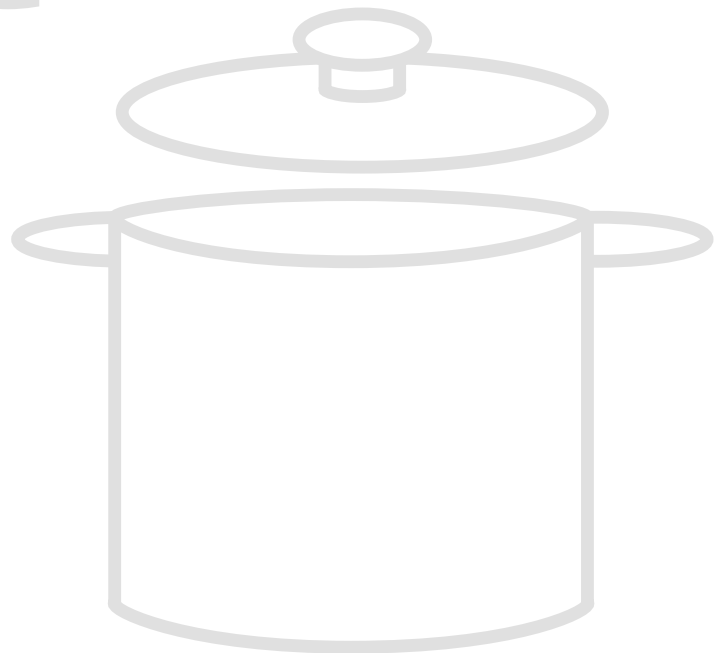
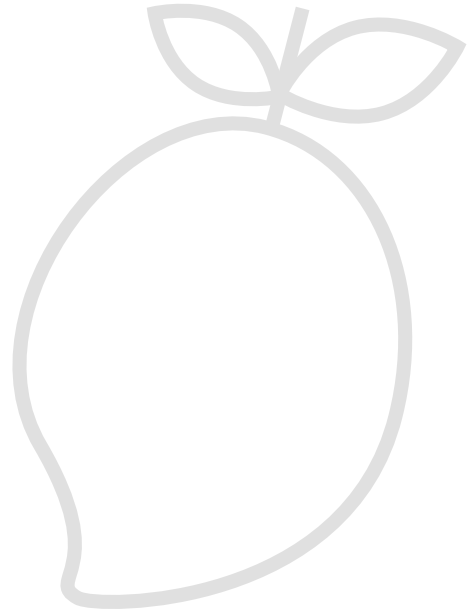
English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.SL.1.1

Participate in collaborative conversations with diverse partners about *grade 1 topics and texts* with peers and adults in small and larger groups.

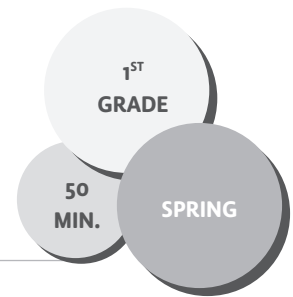
CCSS.ELA-LITERACY.RL.1.2

Retell stories, including key details, and demonstrate understanding of their central message or lesson.



Our Food Traditions

THEME: CONNECTING FOOD, CULTURE, AND COMMUNITY



ESSENTIAL QUESTION

Why do we celebrate important moments with food?

LEARNING OBJECTIVES

- ✓ Students will be able to identify food groups.
- ✓ Students will be able to illustrate a celebratory food tradition.

LESSON DESCRIPTION

In this lesson, students review the food groups and learn about diverse food traditions by making a drawing of a special meal they've eaten and sharing their drawing with their classmates.

MATERIALS

For each student

- paper plate
- 1 fork (optional)
- Markers and colored pencils
- Food Group Sorting Cards (pp. 180–182)
- Other food group resources, such as handouts of MyPlate or Oldways food pyramids

PREPARATION

- › On a paper plate, create your own drawing of a special food memory to serve as a model for students. Label the different food groups.
- › Photocopy and cut apart Food Group Sorting Cards.

- › Photocopy other food group resources, such as handouts of MyPlate or Oldways food pyramids.

ACTION STEPS

1. Engage: Explain to students that eating food together is a special way to share time with people you care about. Ask, *What does it mean to celebrate?* Tell students that today they're going to think about the food they have eaten when they celebrated something, and they will share that with their classmates. Say, *Think of a time you shared a special meal with your friends and family, your community, when you were celebrating something. (5 min.)*

2. Drawing a Celebration: Pass out paper plates. On the back, have students draw pictures of their special event. Encourage them to draw pictures of the people who were there and the activities they did. **(10 min.)**

3. Reviewing Food Groups: Show students the Food Group Sorting Cards, and ask them which foods belong in each group. Then tell students the story of your special meal, and show them the paper plate drawing of your meal. Ask questions so that students identify the food groups of your meal. For example, say, *My special meal included macaroni and cheese. What are the two food groups in macaroni and cheese?* After you've gone over each food

group in your meal, tell students that they're going to be drawing their meal on the front of their paper plate just like you did. Explain that it's fine if their meal only includes one or two food groups. **(5 min.)**

4. Drawing Paper Plate Meal: On paper plates, have students draw the meal they ate at their special event, labeling the different food groups. You may want to have some resources on hand such as MyPlate, Oldways food pyramids, and the Food Group Sorting Cards, to help students recall the different food groups. Give students a three-minute warning to finish their drawing, but also let them know it's okay if they're not done because they can add more later. **(10 min.)**

5. Sharing with Partners: Tell students, *Now you're really lucky because you're going to swap meals with a partner, and use your imaginations to enjoy your partner's tasty dish!* Model the process: Ask a student to trade plates with you, and ask the student to describe the meal that you drew. Then ask the student to describe their meal to you. Enthusiastically pretend to eat the student's meal, commenting on what you're tasting. As students do this, you can pass out forks to enhance the experience of pretending with a prop. **(5 min.)**

6. Passing Plates Whole Class: Have students gather in a circle with their paper plate meals to share. Build anticipation by saying something like, *Have you ever eaten thirty meals at the same time? Well, get ready because that's what we're about to do.* Explain that they're going to pass plates around the circle so that every student will get to experience everyone else's meal. Tell students the signal you'll use when it's time to pass plates, such as saying,

Lettuce switch! Encourage students to observe their classmates' plates, look for all the food groups, and then pretend to eat the meal portrayed. Before you begin, discuss ways of showing respect and appreciation for another person's work, such as making *yum* or *mmm* sounds while they're pretending to eat, and by handling one another's paper plates with care. Start the activity, and give students about ten seconds with each plate before giving the signal to switch again. Pass meals in one direction, at the same steady pace, until all students have their meal returned to them. **(10 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *What were some example foods from each of the food groups? Go through them one by one.*
- *What were some things you learned about one another in this activity? What were some things you learned about food?*
- *When we were learning about each other's culture and traditions, what were some ways we showed respect and appreciation for one another?*

ADAPTATIONS

Language: Ask students to share the names of their dishes if they know them. If the name is something unfamiliar to students, have the class practice saying it together.

At Home: Have students bring a paper plate home to illustrate together with a caregiver while discussing a special meal.

ACADEMIC CONNECTIONS

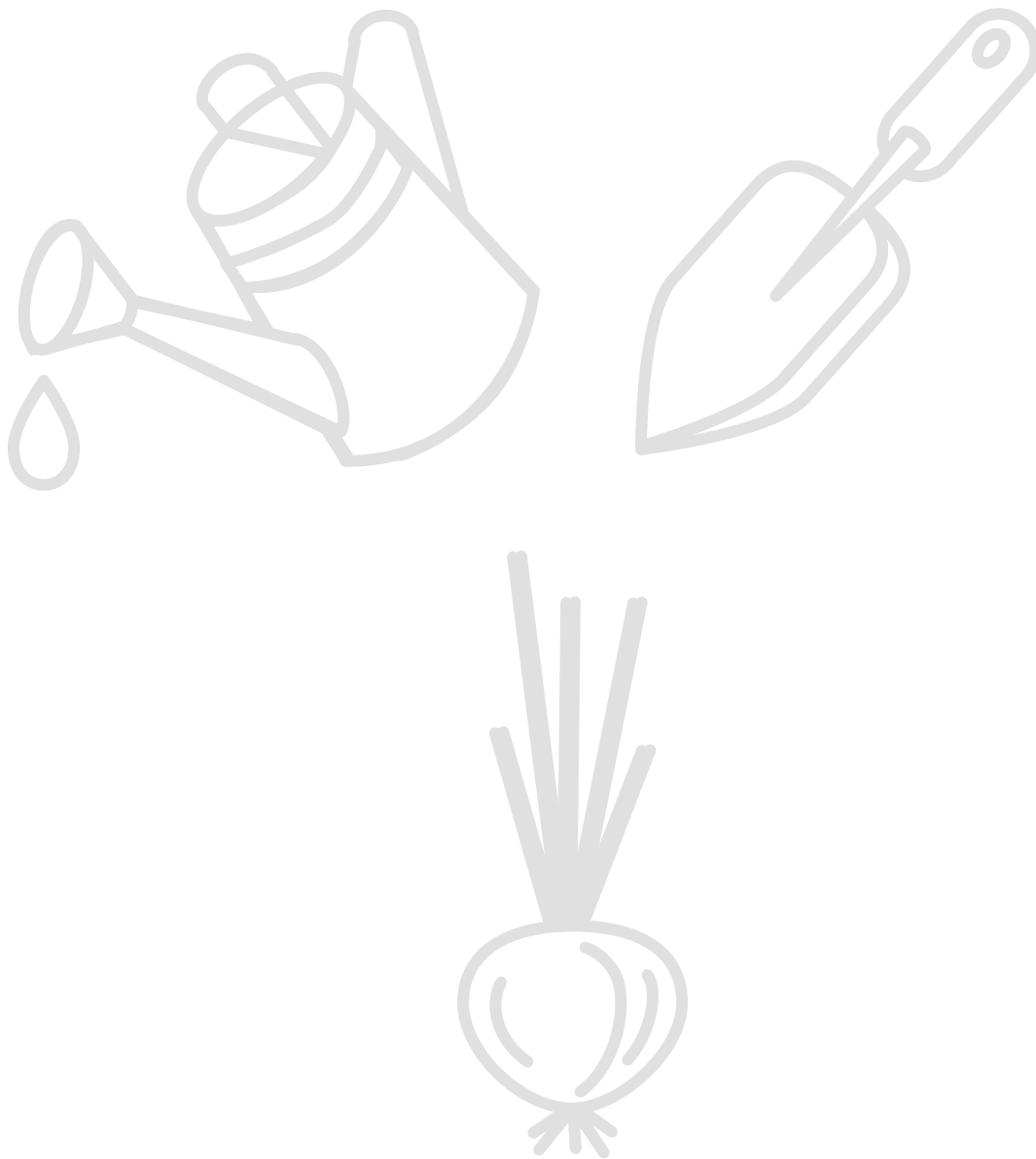
English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.SL.1.1

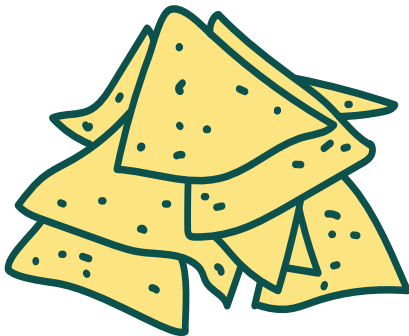
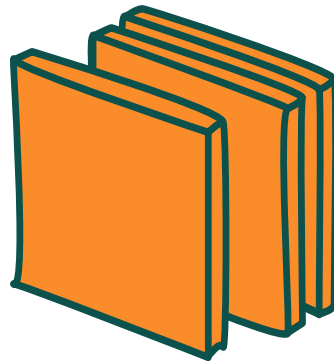
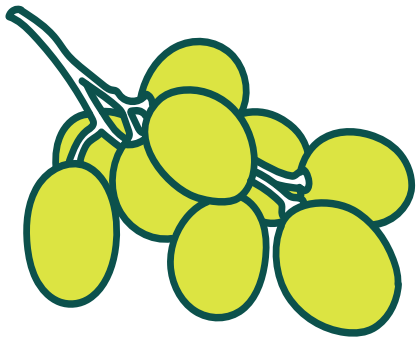
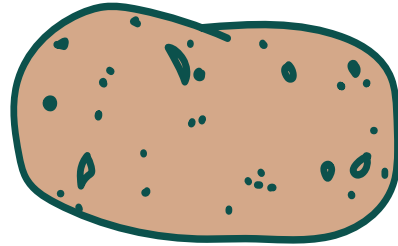
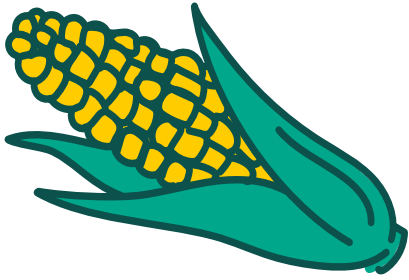
Participate in collaborative conversations with diverse partners *about grade 1 topics and texts* with peers and adults in small and larger groups.

CCSS.ELA-LITERACY.SL.1.4

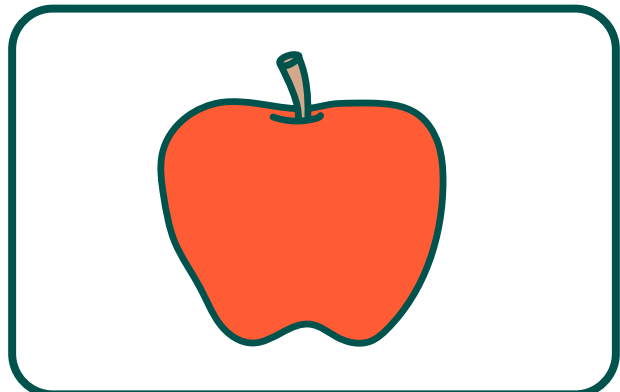
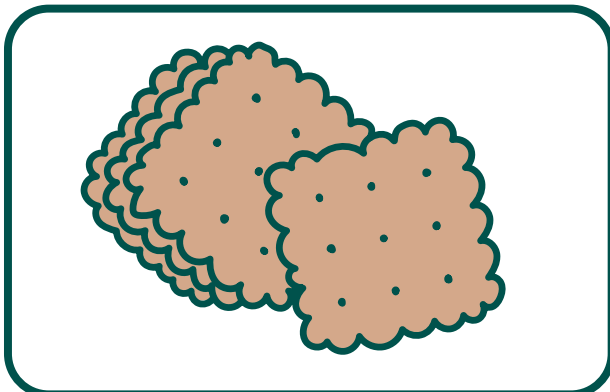
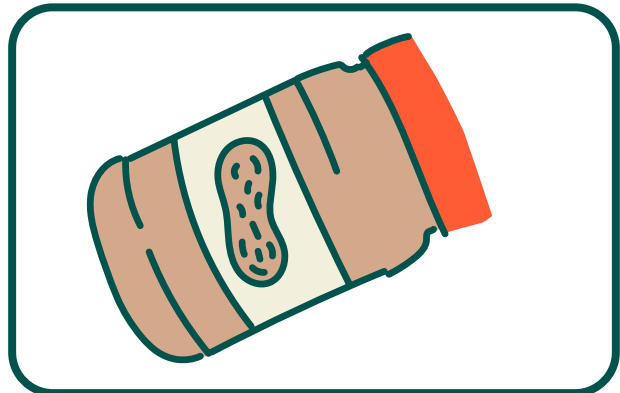
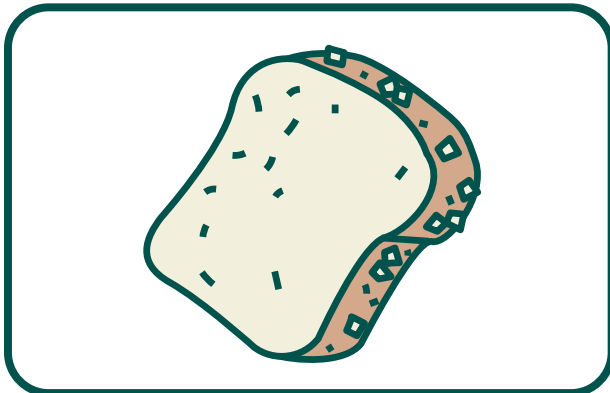
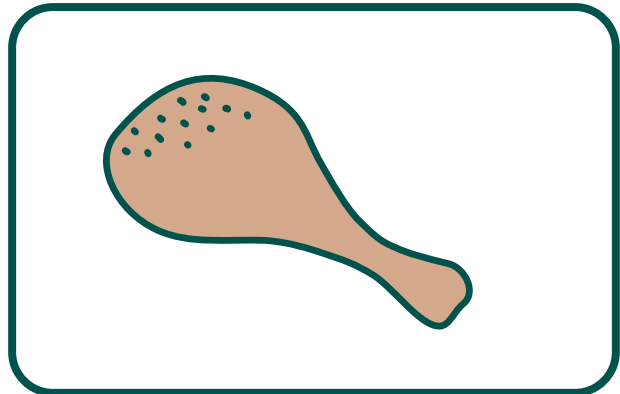
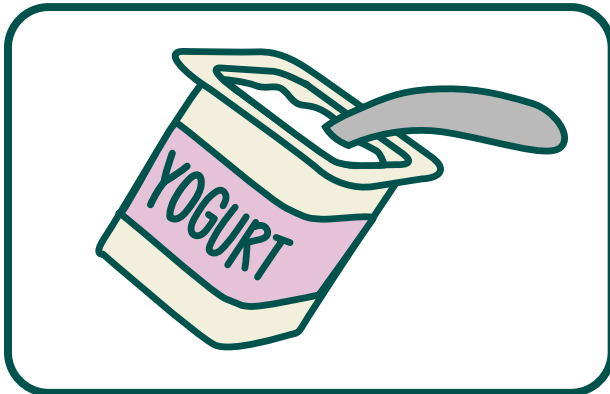
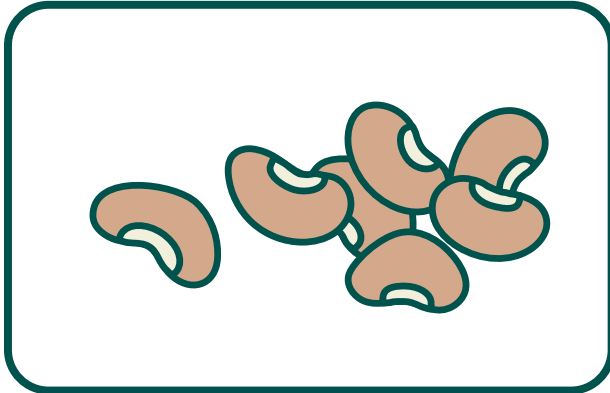
Describe people, places, things, and events with relevant details, expressing ideas and feelings clearly.



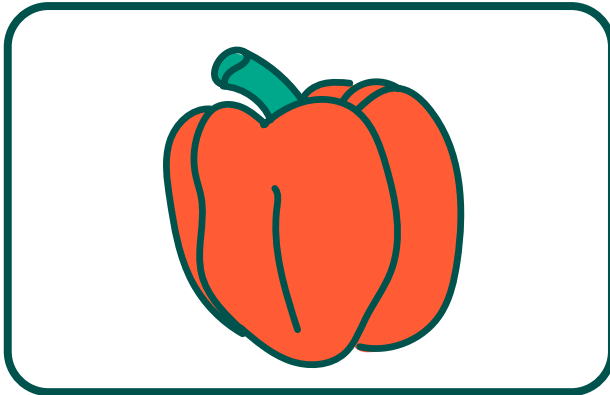
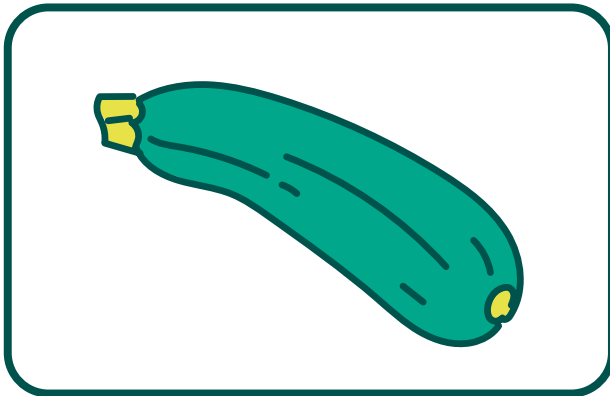
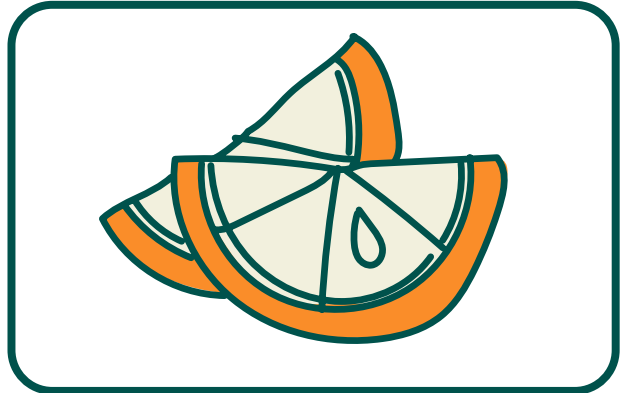
Food Group Sorting Cards



Food Group Sorting Cards



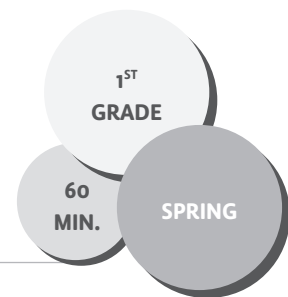
Food Group Sorting Cards



Looking Closely at Leaves

THEME: EXPLORING THE ECOLOGY OF FOOD

Inspired by California Academy of Sciences', "Introduction to Scientific Sketching" lesson



ESSENTIAL QUESTION

Why are careful observation and accurate recording important in science?

LEARNING OBJECTIVE

- ✓ Students will be able to use close observation skills.
- ✓ Students will be able to create scientific sketches.

LESSON DESCRIPTION

In this lesson, students learn the foundations of scientific illustrations. They closely observe a leaf specimen, drawing it with enough detail that a classmate can find it in a group of leaves from the same plant. They then draw a plant from the garden, practicing the “ABCs of scientific illustration.”

MATERIALS

For each student:

- Leaf (all students receive leaves from the same tree or plant)
- Printer paper
- Clipboard
- Pencil
- Colored pencils
- Whiteboard
- Dry-erase markers of various colors
- ABCs of Scientific Illustration poster

PREPARATION

- › Gather leaves for your students to sort and draw. Leaves should be from the same tree or plant but have enough variation for students to notice when drawing and sorting.
- › If you don't have a whiteboard, you can prepare accurate and inaccurate illustrations of your object for Step 3 ahead of time.

ABCs of Scientific Illustration

**Accurate
Big
Colorful**

ACTION STEPS

- 1. Engage:** Gather students in a circle and say, *Today you're going to be scientists and artists! Pass out a leaf to each student, and ask them to observe everything they can about it. You may want to prompt students by asking questions such as, Does it have speckles? Does it have smooth edges?* Tell students to remember what their leaf looks like because soon they'll have to tell which is theirs from a pile of leaves. **(5 min.)**
- 2. Finding Your Leaf:** Put students into groups of six, and have them put their leaves in the middle of their group. Come around and jumble each group's leaves, and challenge

students to find their leaf again. Ask, *Who was able to find their leaf again? What made it helpful to find your leaf?* Reinforce the idea of paying careful attention and noticing the details of their leaf. **(5 min.)**

3. Explain: Explain to students, *Today, we're going to make scientific illustrations. This is different from art. In art, we might be drawing to make something beautiful or creative. In scientific illustration, we're going to draw to share information.* Show students an object such as a flower, and then draw an inaccurate, cartoon-like version of the flower quickly, perhaps not even looking at the object. Ask students, *Does my drawing look like the flower?* Explain that it might be a beautiful or exciting piece of art, but for this to be a scientific illustration, it needs to look a lot like the real flower. Ask, *How could my drawing look more like my flower? What should I do?* (slow down, and notice all the small things). Take suggestions from students, and then draw the flower as accurately as you can. Ask, *Does this drawing look like my flower? How do you know?* Explain to students that your second drawing is more accurate than your first. Ask, *What do you think I might mean by "accurate"?* Have them share in pairs. Then say, *Accurate means it looks close to how it looks in real life, instead of what I imagine in my mind.* Show students the ABCs of Scientific Illustration poster, explaining, *When scientists are out in nature, they often need to record what they see, and it's important for their drawings to be accurate. Being big and colorful helps too! When your drawing is big, you can see all the details, and when your drawing is colorful, it looks more like real life.* **(10 min.)**

4. Drawing Our Leaves: Have students draw the leaf they originally studied at the beginning of the lesson, practicing the ABCs. **(10 min.)**

5. Group Guessing Game: Have students return to their original group of six. Say, *Put all your leaves in the middle again, and place your drawing around the leaves in a circle. Now each person in the group can take a turn to see if they can make a match. If someone in the group matches with your drawing, you can tell them yes or no.* Have students play until everyone has had a chance to guess (which may mean stopping before the group guesses all drawings correctly). **(10 min.)**

6. Drawing a Living Plant: If you have time, give students the chance to further practice the skill of scientific illustration. Say, *OK scientists, I'll give you one minute to find a plant to draw. Once that minute is up, you have to stay with your plant, and draw the plant using the ABCs. Ready?* Have students walk around the garden to select a plant to draw a full scientific drawing of. Circulate through the garden once students have settled with their plant, encouraging students to add more detail or pointing out interesting aspects of their plant to add to their drawing. **(15 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *What was helpful about a drawing when you were trying to find the matching leaf?*
- *What makes a drawing accurate?*
- *Why do you think scientists try to draw accurate pictures of what they're observing?*

ADAPTATIONS

Age: For older students, you can introduce the ABCDEs with the requirements “detailed” and “explained” added.

Upper Grade Classroom Extension: Create a book with class illustrations of your school garden’s plants! Bring in botanical illustrations for students to observe. Then assign each student to a plant in your garden, and have them study and draw their plant over multiple sessions. Their final/best drawing can then be included in the compiled class book.

ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.L.1.4.A

Use sentence-level context as a clue to the meaning of a word or phrase.

Next Generation Science Standards, Life Science Disciplinary Core Idea

NGSS LS3.B: Variation of Traits

Individuals of the same kind of plant or animal are recognizable as similar but can also vary in many ways. (1-LS3-1)



ABCs of Scientific Illustration

F **ACCURATE**

B **BIG**

G **COLORFUL**

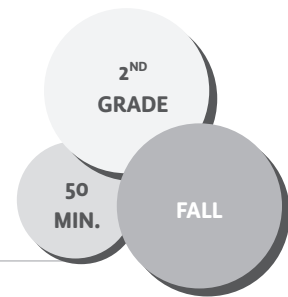


Second Grade

LESSONS

If Our Class Were a Soup . . .

THEME: LIVING UP TO OUR FULL POTENTIAL



ESSENTIAL QUESTION

How does sharing help a community?

LEARNING OBJECTIVE

✓ Students will be able to identify and describe what they contribute to their class community.

LESSON DESCRIPTION

In this lesson, students consider the importance of sharing within a community through reading *Stone Soup* and creating a classroom poster of a soup cauldron to which they'll each contribute their favorite vegetable as an ingredient.

MATERIALS

- *Stone Soup* (The 2003 version by Jon J. Muth emphasizes community and sharing)
- Big ladle or wooden spoon
- Large piece of butcher paper
- Construction paper or other drawing paper for all students
- Markers or crayons
- Scissors
- Tape, glue, tacks, or stapler for affixing vegetable pictures to poster
- Seed catalogs or other vegetable images (optional)

PREPARATION

- › Using butcher paper, create a large poster of a big soup pot or cauldron that will represent the classroom soup pot, leaving room to attach each student's vegetable drawing.

- › Create a model vegetable the ideal size for students' drawings.
- › Find a space on a classroom bulletin board or wall where you'll display your cauldron poster after the lesson.
- › If students are in table groups, you may want to create sets of crayons, markers, paper, and scissors for groups to share.

ACTION STEPS

1. Engage: Begin by having a discussion about sharing with students. Ask, *Think of a time you shared food, a toy, or something else with a friend. What is difficult about sharing? What are some good things about sharing?* **(5 min.)**

2. Reading: Gather students in a circle to read *Stone Soup*. If you don't have the text but have access to a computer and projector, find a video on YouTube. As you're reading, ask some questions about the plot to check for understanding. For example, ask, *How did the villagers treat the strangers at first? What happened when the villagers saw their neighbors contributing to the soup? What else did the villagers do at the banquet in addition to just eating?* **(10 min.)**

3. Discussing: Discuss themes of the book, getting to the idea that we enjoy everything more when everyone contributes a little of what they

have. Tell students, *We'll be creating our own stone soup as a class by drawing pictures of our favorite vegetables and putting them into this classroom soup pot.* Show your cauldron, vegetable model, and the supplies you have for them to use. Say, *You can add any vegetable to our soup that you think is tasty, and be sure to write your name on your vegetable so we know who contributed that ingredient.* **(5 min.)**

4. Drawing: Have students return to their desks and draw, color, and cut out their vegetables. You may want to have seed catalogs or other vegetable visuals around to help generate ideas. Give students a five-minute warning before it's time to clean up and have their contributions ready. Early finishers can add a second vegetable. **(10 min.)**

5. Gathering: Make sure students have cleaned up their areas and put supplies back before asking them back to the circle with their ingredients in hand. Sit in a circle with your soup pot poster in the center. Explain, *When we eat foods with all these different vegetables that are different colors and different parts of the plant, we're giving our bodies what they need. Our class is like a soup! Each person has their own special characteristics that add something to the class community. Think about what you bring to the class. Maybe you bring jokes to make people laugh. Maybe you bring a helpful attitude. Take a minute to think of something positive you add to this class. If you need help thinking of something, you can ask me or a friend. When you're ready to share, raise your hand, and when I call on you, you can add your vegetable to our soup, and tell us what you add to the class.* One at a time, have each student place their vegetable into the soup pot

and share what they add to the class. During each student's turn, give him or her a ladle or spoon to pretend they're stirring their ingredient into the pot. **(15 min.)**



(After Class) Affix the veggies onto the soup pot poster, and hang it in the classroom. You might title it something like "Vegetable Soup Builds Community."

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- How do you think sharing helps a community?
- We all add different things to the class community. How can we support one another's differences?
- What are some ways we can be like the villagers at the end of the story in our own classroom community? What are ways that we can share? What are other nice things we can do for our classmates?

ADAPTATIONS

Garden Setting: If doing this activity outdoors, instead of students drawing a vegetable to contribute, you can create a collective piece of art. Have students hunt through the garden for a special object such as a flower, leaf, stone, or twig to add to the class artwork.

Variation: Instead of having students name their own contributions to the class, you can pair students, and have partners identify for each other what each brings to the class community. You can model this using the classroom teacher as your partner.

Cooking Extension: Make real stone soup with your students, inviting different groups to prepare and add different ingredients. (See lesson Stone Soup.)

ACADEMIC CONNECTIONS

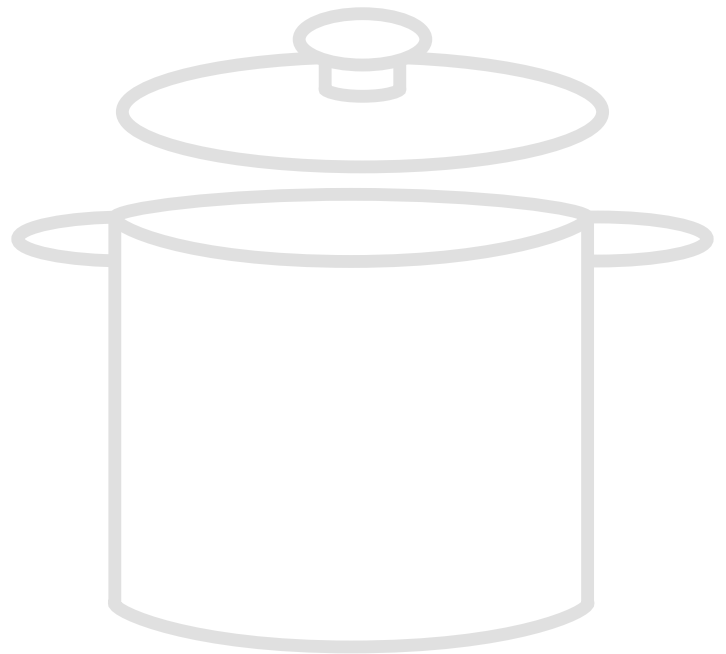
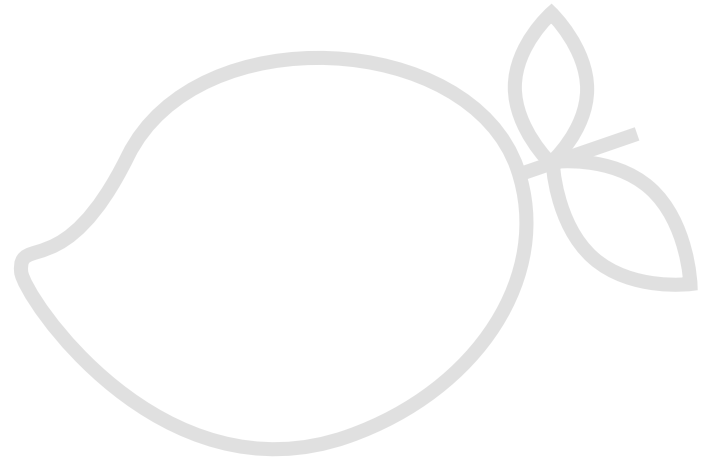
English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.RL.2.7

Use information gained from the illustrations and words in a print or digital text to demonstrate understanding of its characters, setting, or plot.

CCSS.ELA-LITERACY.SL.2.1

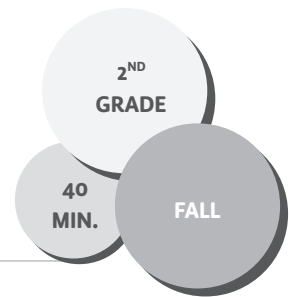
Participate in collaborative conversations with diverse partners about *grade 2 topics and texts* with peers and adults in small and larger groups.



Eat a Rainbow

Adapted from Life Lab's *The Growing Classroom*

THEME: MAKING HEALTHY FOOD CHOICES



ESSENTIAL QUESTION

Why is eating a rainbow of fruits and vegetables important?

LEARNING OBJECTIVE

✓ Students will be able to explain the benefit of eating a variety of fruits and vegetables.

LESSON DESCRIPTION

In this lesson, students learn about the benefits of eating a variety of phytonutrients by matching various fruits and vegetables to a color information card. They then prepare an explanation for why their group's color is vital to health, and create a large poster of a body to represent the different colors' benefits. This lesson is designed to be taught in conjunction with fall lesson Plant a Rainbow and spring lesson, A Rainbow at the Salad Bar.

MATERIALS

- About 5 feet of light-colored butcher paper
- Permanent marker
- Markers
- Rainbow Cards (p. 193)
- Fruit and Vegetable Cards (p. 194)

PREPARATION

- › Photocopy and cut out the Rainbow Cards and the Fruit and Vegetable Cards.

- › Place butcher paper on the floor, and draw a life-size outline of a body on it in a fun pose.

ACTION STEPS

1. Engage: Gather students in a circle, and ask them what their favorite color is. Once they think of their favorite color, ask them to think with a partner of as many fruits and vegetables that are that color. After they've shared say, *Fruits and vegetables have different vitamins and nutrients that help our bodies stay healthy. The more colorful the foods we eat the better, and different colored fruits and vegetables help us in different ways. (5 min.)*

2. Sorting into Groups: Show students the outline of the body, and explain that today they're going to learn about how the different colors of the foods we eat help our bodies. Say, *By the end of class, the body will be filled in with all the new things you learn. Give one Rainbow Card to each student, and, when you run out of those, give each remaining student a Fruit and Vegetable Card. Say, Now you'll go around and find your matches. So if you have the Red card, you'll want to find all the people with red fruits and vegetables. Have students circulate through the room, finding their matches. (5 min.)*

3. Preparing Explanations: Once students have sorted themselves into groups, explain that they'll teach the rest of the class why eating

fruits and vegetables of their color is important for all-around health. Make sure they know to find the information on the health benefits of each color on their Rainbow Cards. Circulate through the room, helping students make the connection between the color and the parts of the body the color benefits. **(10 min.)**

4. Presenting: Have each group present to the class why their color is important. After each group presents, summarize for students why the color is beneficial for our bodies, and color the associated parts of the body on butcher paper with that color marker. For example, you might draw teeth in green or a heart in red. Solicit ideas from students for how to represent the information. For example, to represent the idea that blue or purple foods are good for the brain, you might draw blue or purple thought bubbles. **(15 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *Why is it important to eat a variety of colorful fruits and vegetables?*
- *What fruits or vegetables have you eaten today? What colors are they?*
- *What colored fruit or vegetable would you like to eat next and why?*

ADAPTATIONS

Garden: Pass out the Rainbow Cards to students, but instead of matching them to pictures of fruits and vegetables, have them find fruits and vegetables in the garden to represent each color.

ACADEMIC CONNECTIONS

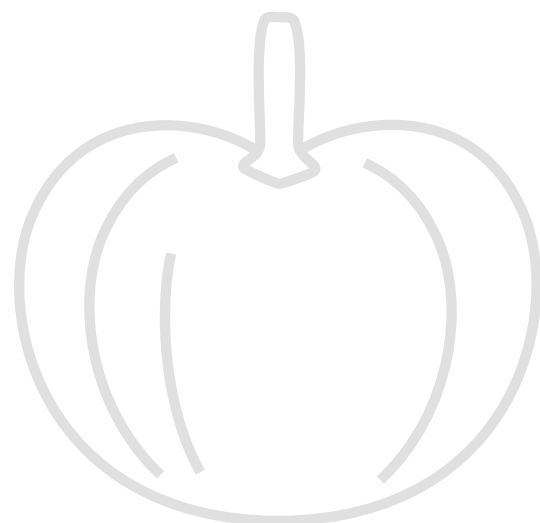
English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.SL.2.6

Produce complete sentences when appropriate to task and situation in order to provide requested detail or clarification.

CCSS.ELA-LITERACY.RI.2.9

Compare and contrast the most important points presented by two texts on the same topic.



Rainbow Cards

RED

Can improve heart strength and skin health



**ORANGE/
DEEP YELLOW**

Can promote good vision, especially in the dark



**YELLOW/
BROWN/WHITE**

Can make blood healthier




GREEN

Can strengthen bones and teeth



BLUE/PURPLE

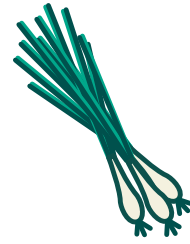
Can improve memory and healthy aging



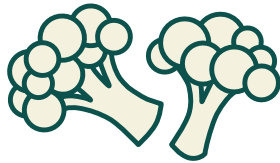
Fruit and Vegetable Cards



Nasturtium



Scallions



Cauliflower



Parsley



Celery



Sunflower Seeds



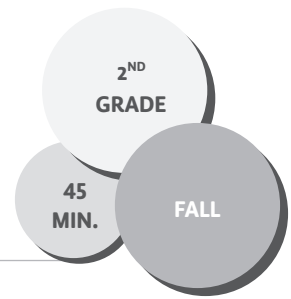
Rhubarb



Pumpkin Seeds

Biodiversity in the Garden

THEME: EXPLORING THE ECOLOGY OF FOOD



ESSENTIAL QUESTION

Why is diversity in the garden important?

LEARNING OBJECTIVES

- ✓ Students will be able to describe the diversity they find in the garden.
- ✓ Students will be able to sow seeds.

LESSON DESCRIPTION

In this lesson, students consider the importance of biodiversity by observing and drawing all the life in one square of their garden. They then learn about companion planting, and they sow or transplant “plant friends” in the garden.

MATERIALS

- Yarn or string
- Scissors
- Seeds or transplants appropriate for your growing region

For each pair of students:

- Magnifying lens
- Paper
- Clipboard
- Pencils
- Watering can

PREPARATION

- › Research what plants grow well in your climate in the fall.

- › Measure and cut a 48-inch piece of yarn for each pair of students.
- › Prepare a bed for planting.

ACTION STEPS

1. Engage: In the garden, gather students in a circle and explain, *Today we’re going to be thinking about all the different types of plants and animals that we find in nature and in our garden.* Demonstrate for students how to take a piece of string and tie the two ends together to make a circle. Then lay your string in a square shape on the ground where students can see. Ask students, *How many different living things can you see in this circle? How many living things do you think we’d find if we looked closer?* Explain that you’ll give pairs of students a piece of string that they’ll lay on the ground somewhere in the garden and then look closely with magnifying lenses to observe all the living things they can find. Review the expectations for being in the garden, such as students staying where you can see them and not disturbing freshly planted seeds, etc. **(5 min.)**

2. Life in a Square Foot: Explain that pairs will draw a picture together of each different plant or animal they find in their square, and they should label the living creatures if they think they know their name. Note that some of the creatures might be in the soil. Say, *You’ll have to get really close and be really still to see all*

the living creatures! Pass out string, magnifiers, and clipboards with paper and pencil to pairs of students. Circulate through the garden, encouraging students to look closely and try to identify all the life they discover. **(10 min.)**

3. Discussing Benefits of Diversity: Call students back together, and have them share what they found. Go around the circle and have each pair share one living thing they observed that hasn't already been said. Explain that having all these different types of living things is called diversity. Have students repeat the word diversity, and then ask, *Why do you think it's good to have diversity in our garden? How does having diversity in our garden help the plants and animals live there? How does it help the people who harvest food from there?* Have pairs turn and talk to each other. Get to the idea of diversity in the garden meaning diversity on our plate. **(5 min.)**

4. Learning about Companion Plants: Explain to students that certain plants help other plants in the garden. Say, *These are plant friends. Like a friend, certain plants can help other plants grow strong and be healthy. For example, the marigold plant, which has beautiful flowers, can attract bees and other pollinators, so a plant will grow fruit, but it can also keep away pests that would hurt the plant. Or a sunflower can help give plants, like beans or cucumbers, a place to climb because that's what they like.* Explain that you'll be planting some plant friends in your garden today. **(5 min.)**

5. Planting: In the fall, you might have pairs of students plant carrots and radishes because the radishes will help break up the soil for the carrot taproots. Or consider planting nitrogen-fixing fava beans with nitrogen-loving lettuce. Or plant

garlic next to a brassica such as cabbage, kale, or broccoli to help deter aphids. **(15 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *What were you surprised to find inside your circle?*
- *How did we help the plants in our garden today?*
- *Why is diversity in our garden important?*
- *Why is diversity in the foods we eat important?*
- *Why is diversity in our community important?*

ADAPTATIONS

Science Inquiry: Have students create a control garden bed in which you don't plant a companion crop. Over the season, students can make observations about the health and growth of the crop with a nearby plant ally, versus the crop growing alone.

Soil Study: Have students investigate the biodiversity in the soil. Explain that plants grow well with a diversity of life in the soil, just like we grow well when we eat many different plants.

ACADEMIC CONNECTIONS

Next Generation Science Standards, Life Science Disciplinary Core Idea

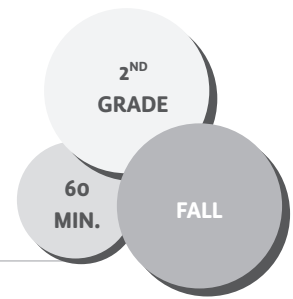
NGSS.LS4.D

Biodiversity and Humans

There are many different kinds of living things in any area, and they exist in different places on land and in water.

Plant a Rainbow

THEME: GROWING AND ACCESSING HEALTHY FOOD



ESSENTIAL QUESTION

Why are the foods we eat and the diversity in our garden important?

LEARNING OBJECTIVE

✓ Students will be able to sow and transplant crops.

LESSON DESCRIPTION

In this lesson, students hunt for the full spectrum of colors in the garden, create a fruit and veggie rainbow collage, and plant (in color groups) a rainbow garden bed to overwinter.

MATERIALS

- Colored chalk
- Dot stickers of each rainbow color (optional)
- Paint sample color strips (such as those found in a hardware store that sells paint), one for each student, with an equal distribution of red, orange, yellow, green, blue, purple
- Basket or bucket to hold paint chips (for random selection)
- Butcher paper
- Black permanent marker
- Magazines/seed catalogs
- Glue
- Scissors
- Plant markers
- Seeds or transplants to represent each color
- 5 garden trowels
- 5 watering cans
- Hose (to refill watering cans)

RAINBOW CROP SAMPLES

- **Red:** ruby red chard, red beets
- **Orange:** carrots, orange calendula flowers
- **Yellow:** golden beets, yellow calendula flowers
- **Green:** lettuce, cabbage, broccoli, kale, peas
- **Blue/Purple:** purple kohlrabi, borage flowers

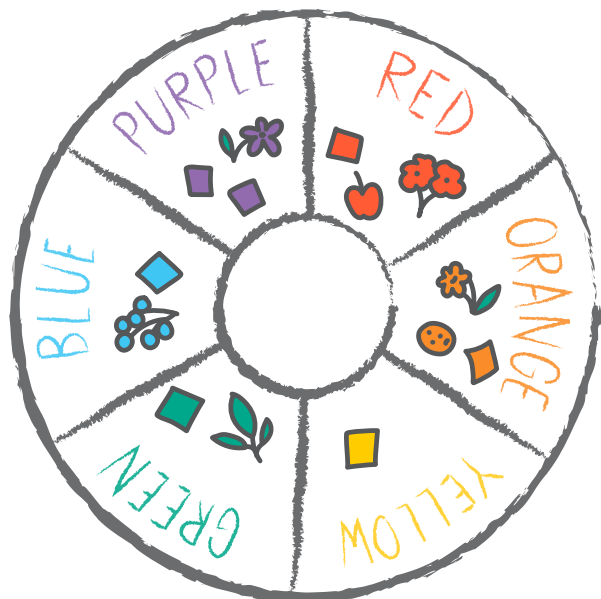
PREPARATION

- › Acquire paint samples from the hardware store.
- › Consult a local planting guide for your region, and determine what you'll be planting. In the fall, they'll either need a quick germination and maturity rate or be overwintering. Also, be sure your plants have similar growing requirements because they'll be planted close together.
- › Scout out a location in your garden to make your rainbow bed. You might want to pre-divide a raised bed into six sections, so it's a spectrum, or you might choose to make a rainbow arc. Either way, use labeled plant markers to make it clear to students where certain colors are meant to go.
- › Set up a station within sight of the garden bed in which students will work on a collage. If you have a shade structure, you might consider having students make their collage there.
- › Prepare a large piece of butcher paper with the outline of a rainbow in which students will create their collage during the lesson. Write the name of the color in each arc, so students will know which color images should go where.

- › Using chalk, draw a rainbow spectrum in a circle outside on the pavement where you will gather your class. If you don't have any paved space, make a sign for each color to set out on the ground. This is how you'll ultimately divide students into groups.

ACTION STEPS

1. Rainbow Hunt: Gather students in a circle and explain, *Today we'll be planting a rainbow in the garden, but first we're going to see how many different colors of the rainbow we can find already in our garden.* Show students your array of paint samples, and explain that each student will pick one at random and then try to find an exact match of that color from a plant in the garden. Demonstrate how to use two hands to pick the leaf, flower, or fruit that they find, and remind them to either ask before picking, or set a rule that they can only pick if there are least ten others growing. Share the callback strategy you'll use, and remind students to stay where you can see them. Have each student pick one paint sample at random, and let them know they'll have five minutes to hunt for a color match and bring it back to the circle. **(10 min.)**



2. Sharing: Call students back together, and have them place their plant on top of their paint sample in the space with their color on the ground. Once they're standing with their color group, explain, *This will be your group for the rest of the activity.* You might want to pass out dot stickers with their colors so students remember throughout the lesson, and you can easily keep track of who's in each group. Have students rotate clockwise around the circle to observe and admire each of the plant and paint sample matches their fellow classmates found. Ask, *What does this tell us about our garden?* **(10 min.)**

3. Explain the Activity: Say, *When we eat all different kinds and colors of fruits and vegetables, it's really good for us. It's a way to make sure we're getting all the different vitamins we need. It's also really good for our garden if we plant a variety of vegetables.* Show students the spectrum of seeds or transplants you've brought for them to plant, and review tool safety. **(5 min.)**

4. Making a Rainbow Collage: Explain that each group will take a turn to come up and plant, but while they're waiting for their turn, they'll be creating a rainbow collage of fruits and veggies. Show students the butcher paper you've prepared for their collage. Have students work on the collage according to their color group. **(25 min.)**

5. Planting by Color: Call up students by color. Demonstrate how to transplant the starts or sow the seeds that the group will be planting. Remind students to stay in the designated spot for their color and to be mindful of newly planted seeds and starts. Have students water their seed or plant and then send them back to work on the collage. **(5 min. for each group)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- What vegetables did we plant in our garden today?
- Why is it important to have a rainbow of colors in our garden? How about in our diets?
- Which vegetables or flowers are you most excited to harvest?
- Ask yourself: How did I stay safe when using tools and planting in the garden?



ADAPTATIONS

Literacy Extension: Read *Planting a Rainbow* by Lois Ehlert, and have students create their own book about the plants they planted in the activity.

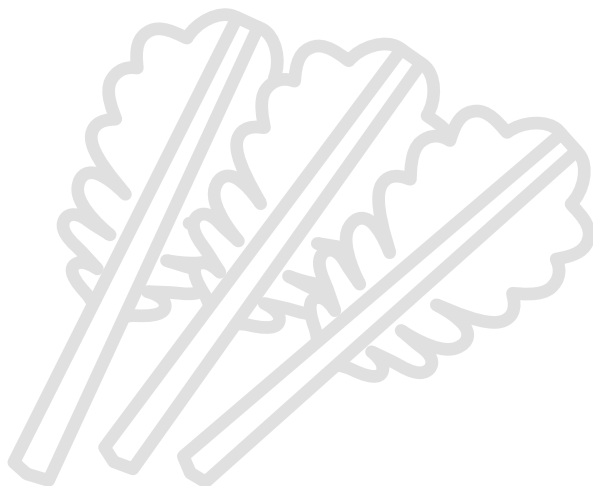
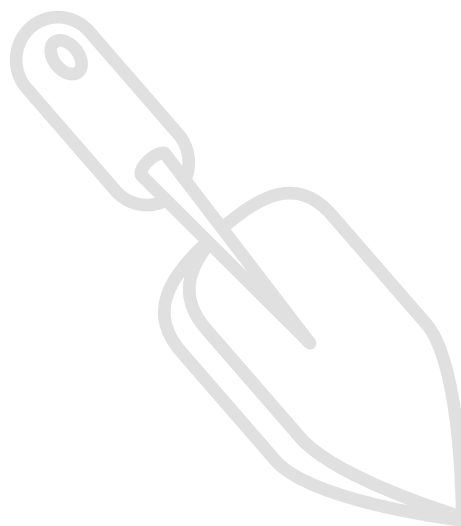
ACADEMIC CONNECTIONS

Next Generation Science Standards, Life Science Disciplinary Core Idea

NGSS.LS4.D

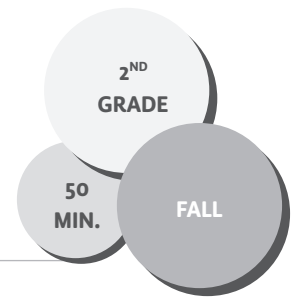
Biodiversity and Humans

There are many different kinds of living things in any area, and they exist in different places on land and in water.



Fun with Fruit Salad

THEME: PREPARING AND ACCESSING HEALTHY FOOD



ESSENTIAL QUESTION

How can we prepare a healthy snack?

LEARNING OBJECTIVE

✓ Students will be able to use multiplication to assemble a fruit salad.

LESSON DESCRIPTION

In this lesson, students collaboratively create a fruit salad in small groups using multiplication.

MATERIALS

- A variety of colorful fruit salad ingredients such as grapes, berries, bananas, kiwi, apple, or pear slices
- Mint leaves, particularly if you have them growing in the garden (optional)
- 1 tray with fruits in separate bowls for each group of 4–6 students

For each student:

- Bowl
- Cutting mat for counting and sorting
- Fruit Salad Recipe Worksheet (p. 207)

PREPARATION

- › Wash and slice bananas, apples, or any other fruit that needs slicing.
- › Portion equal amounts of each fruit into bowls on a tray for each group. Create one extra bowl with some extra fruit to replace anything that might spill.
- › Photocopy the Fruit Salad Recipe Worksheet.

ACTION STEPS

1. Engage: Gather students in a circle, and ask, *What are your favorite fruits to eat?* Explain that today they will be making a fruit salad. **(5 min.)**

2. Model: Explain that you have bowls of delicious ingredients to add to the salad. Give an example. Say, *If I have four people at my table, and each person added three grapes, how many grapes did we put in? (twelve) How did you figure that out? Did anyone figure it out in a different way?* Discuss strategies. Draw on the board, or use a document camera to show the math. **(5 min.)**

3. Wash Hands Break! (5 min.)

4. Making Fruit Salad: Remind students, *We do not want to share germs, so remember not to lick your fingers or taste anything that is going into the group fruit salad bowl. We'll eat everything together at the end.* Give each table group their tray of fruit salad ingredients, and explain that you'll be adding one fruit at a time after instructions are given. Give them math challenges for each fruit, such as, *Everyone put in two slices of banana. Now, how many slices of banana are in there total? Or, We need twelve apple slices total. How many slices should each person put in? How did you figure that out? Did anyone figure it out in a different way?* Discuss strategies. Continue until every piece of fruit has gone in. **(10 min.)**

5. Tasting: Once the fruit salads are made, have students take turns tossing everything together and then serving into smaller bowls. Challenge them to make it as fair as possible. Have students wait until everyone at their table group has their own bowl of fruit salad before beginning to eat. **(10 min.)**

6. Recipe: Show students the Fruit Salad Recipe Worksheet and give them time to make their own recipe to take home. **(10 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *How would you make a fruit salad at home? Would you add any spices, herbs, or other fruits?*
- *What would fruit salad be like with just one type of fruit in it? (bland or boring) This salad has a lot of “diversity” in it. That means there’s a lot of variety or different items included. Our class also has a lot of diversity. We have lots of different people with different personalities, cultures, ethnicities, languages, interests, and talents. What would this group be like if everyone were exactly the same? (boring; we couldn’t learn from each other because we would all know the same stuff, etc.) Diversity makes things interesting and gives us opportunities to learn from one another.*
- *How did you work together to make fruit salad? What would you like to work on in the future in terms of teamwork?*

ADAPTATIONS

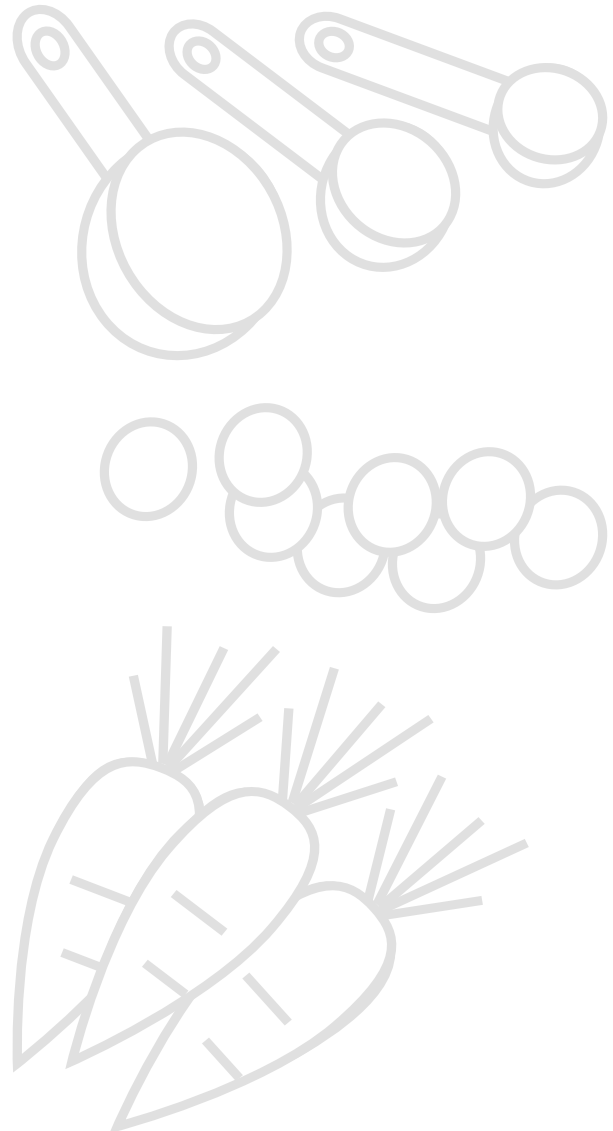
Garden Setting: Add edible flowers, mint, or other items from your garden into the fruit salad. Grow berries or other fruit in your garden.

ACADEMIC CONNECTIONS

Math Common Core State Standards

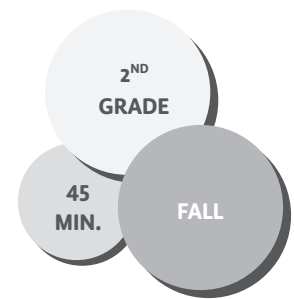
CCSS.MATH.CONTENT.2.OA.C.3

Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.



Saving Seeds

THEME: GROWING AND ACCESSING HEALTHY FOOD



ESSENTIAL QUESTION

Why is it important for people to save seeds?

LEARNING OBJECTIVES

- ✓ Students will be able to explain the benefits of saving seeds from the garden.
- ✓ Students will be able to harvest seeds for saving.

LESSON DESCRIPTION

In this lesson, students collect seeds and take a tour of all the seeds in the garden before making origami seed packets and selecting the vigorous seeds they'd like to save for next season.

MATERIALS

- Plants from which to harvest seeds
- 2–4 medium bowls for harvesting seeds
- Box fan for winnowing seeds (optional)
- Origami paper or template cut into 8.5" x 8.5" squares, 2 for each student (p. 204)
- Colored pencils
- Chart paper
- Markers

PREPARATION

- › Scout the garden for seeds to harvest. Make sure any seeds you want to harvest are ready (e.g., bean pods should be dry and brown). Decide which seeds you'll show small groups on their garden seed tour.
- › Practice making the origami seed packet (see illustration below), so you feel comfortable teaching it to students.
- › Prepare a model origami seed packet that has seed information clearly written and perhaps is colorfully decorated.
- › Set up two stations for seed saving, each with a different plant and a different method for harvesting seeds, if possible. For example, have students threshing beans at one station and picking sunflower seeds at another. Place two bowls at each station for students to collectively put seeds in.
- › On chart paper, write key information for each seed type, such as the name and when to plant the seeds.

Seed-Saving Methods

Deadheading: Cutting dead flowers off of plants and taking dry seeds out of them; use this method with flowers such as calendula, sunflowers, and nasturtium.

Threshing: Rubbing or beating seeds to separate them from other plant material; used for separating seeds from pods or husks. You can rub seedpods between your hands, gently beat them with a rolling pin, place them in a paper bag and shake, or place them in a sack and bang them against the ground. Use this method for peas and beans.

Winnowing: Separating the seed from the other plant material by blowing on them; holding them up to a box fan; pouring them from one bucket into another, back and forth, to let the wind carry away the chaff; or holding them up to the wind. Use this method for grains such as wheat or flax.

Example: For lettuce, place the flower stalk in a paper bag, and shake to separate seed from the chaff. Then take a handful of seed and chaff, and blow off the chaff.



Wet processing: Crush fruits such as tomato or tomatillo in a container, and allow seeds to sit in pulp for several days. The crushed fruit and seeds ferment, which helps the preservation process. Rinse seeds in fresh water, and then lay out on cookie sheets to dry in the sun. Use this method for pulpy fruits.

ACTION STEPS

1. Engage: Gather students in a circle, showing them your sunflower and sunflower seeds (or whatever plant and seed you're using) and ask, *Which came first, the sunflower or the*

sunflower seeds? Have students think-pair-share with their neighbor and then have a couple pairs share with the class. Say, *Did you know that when we grow food we get seeds for free? Instead of buying new seeds every year, gardeners and farmers can save seeds from their plants to plant the next season.* Explain that today they'll be resourceful just like farmers, and save the seeds that are in their school garden right now. **(5 min.)**

2. Stations: Briefly explain each station to students, modeling how to harvest the two different seeds they'll work with. Tell students how they'll know it's time to switch, and split them into three groups, showing them at which station they'll start. Have students rotate through each station for three-to-five minutes each. **(15 min. total)**

a. Seed-Saving Method #1: Have students work independently, harvesting seeds from one plant and placing them in bowls at this station.

b. Seed-Saving Method #2: Have students work independently, harvesting seeds from a different plant, ideally using a different method than at the first station and placing them in bowls at this station.

c. Seed Tour: Guide students on a tour of all the plants going to seed in the garden. Try to show them a variety of food plants, including a bean, fleshy fruit, flower, and plant we eat for the leaves. For example, you might show them a bolted cilantro plant, nasturtium seeds, bolted kale or chard plant, and peas. You might also show them a sliced tomato or pumpkin to demonstrate seeds that are on the inside of fruit. Encourage students to pick and taste any edible seeds on your tour.

3. Making Origami Seed Packets: Gather students back in a circle, and show them your model seed packet, saying, *Now that we've harvested all our seeds, we're going to make origami seed packets so we can take home seeds to save for next season.* Pass out origami paper to each student. Explain that you're going to show them how to make their seed packets step by step. Say, *Once you've finished the step we're on, hold it up so I can see that you're ready to move on. If you need help, ask a neighbor who has finished that step.* Pause after each step to show students your process and check for understanding, while encouraging students to help each other. **(10 min.)**

4. Selecting Vigorous Seeds: Send a couple students to bring over the bowls from the seed-saving stations. Show students two beans, for example, very different in size, and ask, *Which of these do you think I should save to plant next year?* Then ask them to explain their thinking. Say, *For thousands of years people have been saving the seeds from the biggest, nicest, most healthy looking plants so that when they plant they have a good chance of getting other big, nice plants! When you're picking seeds to put into your seed packet, pick the ones you think will grow best in the future.* Based on how many seeds students have processed, give students a maximum amount they can take to use up all your seeds, for example three beans and five sunflower seeds. **(5 min.)**

5. Decorating and Labeling Packets: Show students the chart paper where you've written the key information for each seed. Perhaps do a choral reading where you and the whole class read aloud the words you've written. Pass out colored pencils and extra origami papers

to students so that they can make two packets, one for each type of seed. As they work, circulate through the room, helping students who need support with writing. If there's time, or if some students finish early, they can draw what the plant needs (sun, soil, water, and air) on their packets too. **(5 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *What seeds did you see today that you'd never seen before?*
- *What are the benefits of saving seeds from your garden?*
- *Where will you store your seed packets? Where might you plant your seeds when it's time?*

ADAPTATIONS

Ensuring Seeds Are Planted: If you're concerned that your students won't necessarily hold onto their seeds until spring and then remember to plant them, you can save seeds for crops that they can plant right away at home after this activity. For example, in some areas, fava beans can be harvested and planted in the fall. Alternatively, you can collect and store the seed packets, and then distribute them in the spring for planting at home or planting in the school garden.

Tomato Seed Extension: If you have more time with students and/or extra adult support, you might want to harvest seeds contained in wet fleshy fruit, such as tomatoes or tomatillos using the wet processing method.

Corn Braiding Demonstration: If you grew three or more ears of corn, demonstrate to students how you braid the ears of corn and hang to dry and store seeds.

Planting: If you have seeds you've saved from another season (that would be appropriate for planting in the fall), you can tell students the story of where those seeds came from, and plant the seeds in small groups.

Literacy: Read *A Seed Is Sleepy* by Dianna Hutts Aston to learn more about seeds' life cycles and methods of dispersal.

ACADEMIC CONNECTIONS

Next Generation Science Standards, Life Science Disciplinary Core Idea

NGSS LS2.A

Interdependent Relationships in Ecosystems

Plants depend on water and light to grow.

(2-LS2-1) Plants depend on animals for pollination or to move their seeds around. (2-LS2-2)

3rd Grade NGSS

NGSS LS3.A LS3.A

Inheritance of Traits

Many characteristics of organisms are inherited from their parents. (3-LS3-1)

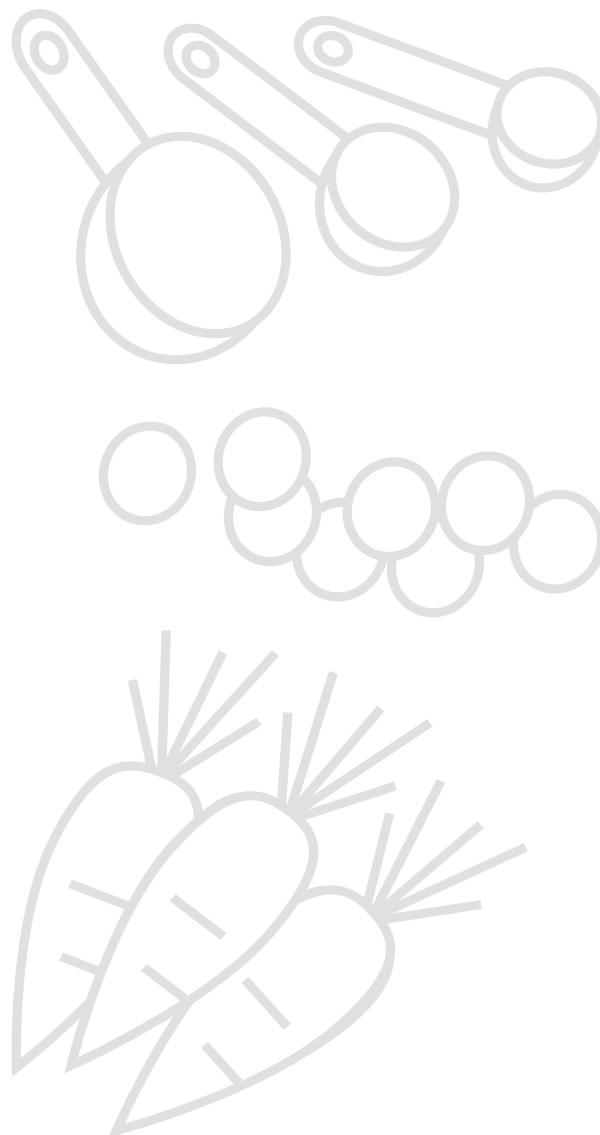
Other characteristics result from individuals' interactions with the environment, which can range from diet to learning. Many characteristics involve both inheritance and environment. (3-LS3-2)

NGSS LS3.B LS3.B

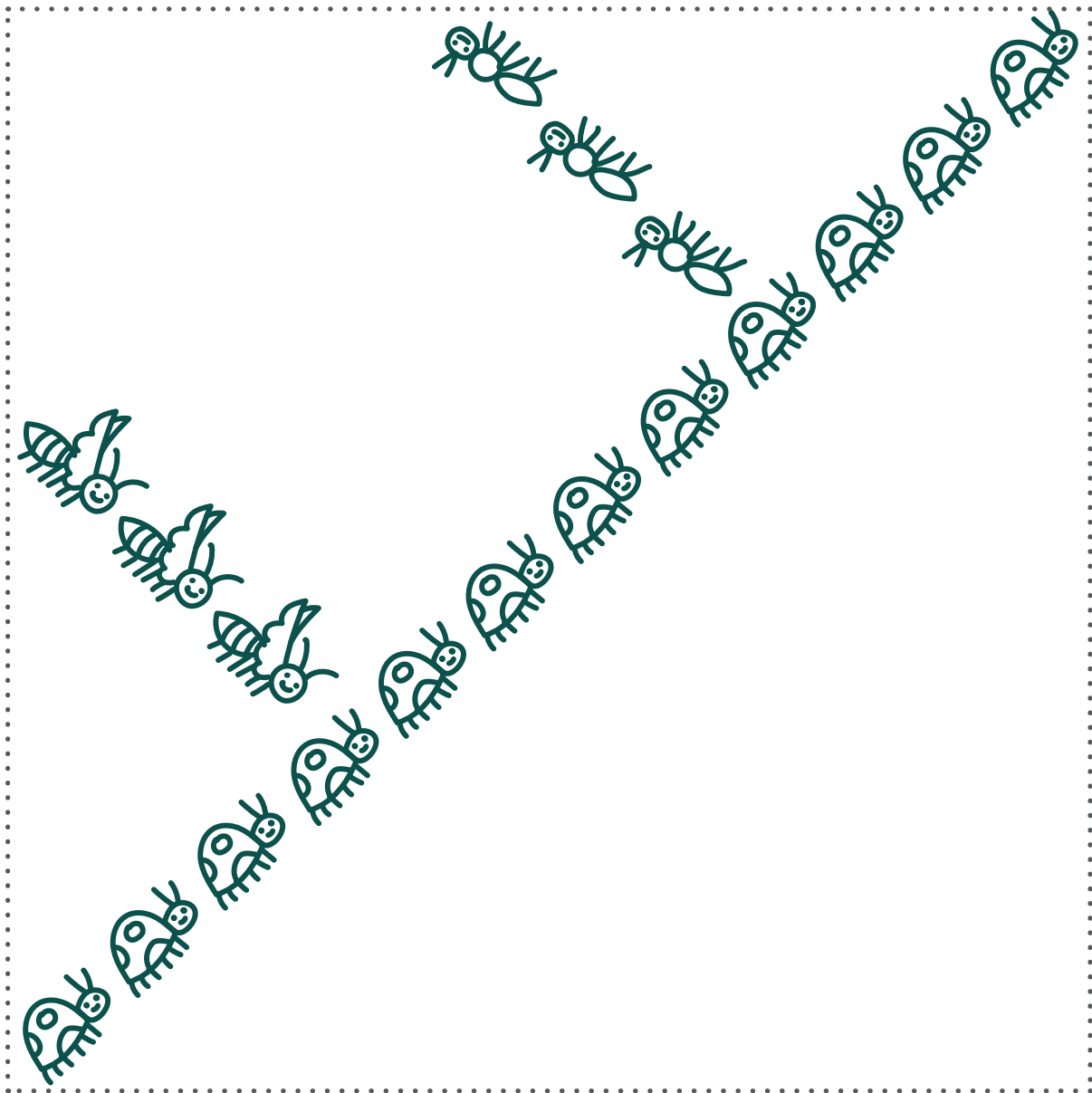
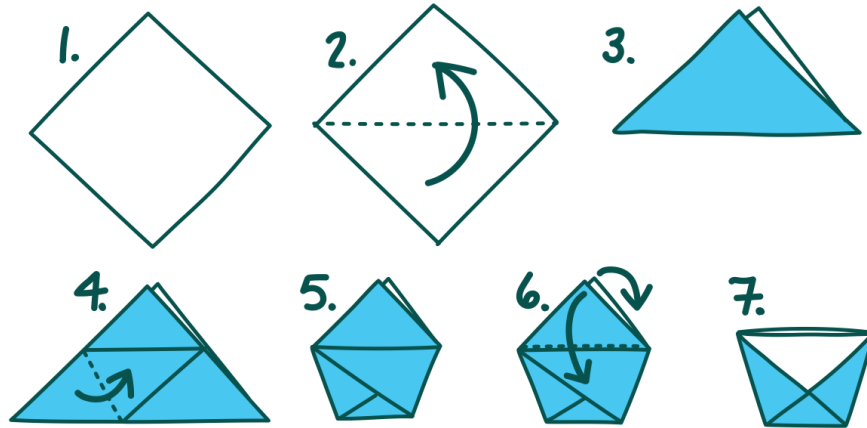
Variation of Traits

Different organisms vary in how they look and function because they have different inherited information. (3-LS3-1)

The environment also affects the traits that an organism develops. (3-LS3-2)

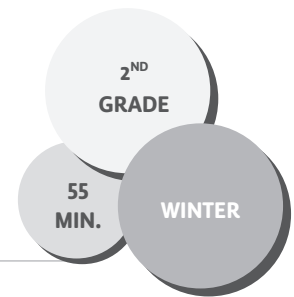


Seed Packet Template



What the World Eats

THEME: GROWING AND ACCESSING HEALTHY FOOD



ESSENTIAL QUESTION

How do the foods of different people around the world vary?

LEARNING OBJECTIVES

- ✓ Students will be able to interpret food pyramids to draw a picture of a balanced meal.
- ✓ Students will be able to summarize what they learned and teach their classmates.

LESSON DESCRIPTION

In this lesson, students create balanced meals incorporating foods found in traditional diets and teach their classmates through a jigsaw cooperative learning activity.

MATERIALS

- Copies of Oldways Traditional Diet Pyramids (can be found online)
 - African
 - Asian
 - Latin American
 - Mediterranean
 - Vegetarian
- Visual of MyPlate to project or a large visual to display
- 1 paper plate for each student
- Pencils
- Markers and colored pencils
- What the World Eats Grouping Cards (p. 211)

PREPARATION

- › Photocopy the Oldways Traditional Diet Pyramids.
- › Photocopy and cut apart What the World Eats Grouping Cards. The set has twenty-five, so determine how many you'll need based on your class size, and do your best to equally distribute students among the groups.
- › If you have access to a computer and projector in the classroom, consider creating a slideshow of photographs from Peter Menzel and Faith D'Aluizio's *Hungry Planet* photography project.
- › Draw a model of a balanced meal on a paper plate to show students.
- › Display the following presentation prompts on chart paper or on the board:
 - › What are some common foods from each food group in the culture you researched?
 - › How is the diet of people in that culture similar to a typical American diet? How is it different?
 - › How do the foods common in the culture you researched reflect what you know about the geography of that region?

ACTION STEPS

1. Engage: Explain that today you'll be considering how different groups of people around the world eat. If using the *Hungry Planet*

images, explain to students that the photographers traveled the world and asked families to show what they eat in a given week. Show students the slideshow, and ask them to make observations about what is similar and what is different about the different families' diets. You might have students number a piece of paper and, for each slide, write their observation in a couple words. Remind students to be respectful of food customs that may be different from what they're used to. In other words, remind students, *Don't yuck my yum!* **(5 min.)**

2. Discussing: Ask, *What foods would we include in the slideshow to highlight the foods we like to eat in our community?* Have students discuss with partners and then share as a class. **(5 min.)**

3. Reviewing Food Groups: Show students MyPlate, explaining that this is what school lunch in the United States is based on. Review each food group, asking students to provide examples of each one. **(5 min.)**

4. Explain the Activity: Explain to students that MyPlate is just one way of balancing the different food groups to make a healthy meal, and different cultures around the world have different ways of eating healthfully. Say, *I'm going to divide the class into five groups that will each study the diet of a different region of the world. As a group, you'll research what a balanced meal looks like, and draw a picture of it on your paper plate. Then you'll go to a new group where each person will share about the diet they studied.* Show students your model. **(5 min.)**

5. Researching (Diet Pyramid) Group: Pass out What the World Eats Grouping Cards,

and assign different parts of the room to be meeting places for the different groups. Then give each group the Oldways Traditional Diet Pyramid that corresponds to the culture they are researching. Give them about ten minutes during which each student in the group will draw their own balanced meal from that culture, based on the information on the pyramid. Circulate through the room, and ask probing questions to keep groups on track. **(15 min.)**

6. Sharing (Shape) Group: Explain that students will now get into new groups based on the shape on their card. Designate spots for each group, and have students bring their plates with them as they switch and get settled into their sharing groups. Sharing groups should have one representative from each Diet Pyramid Group. Explain that each student will have two minutes to tell their sharing group about their balanced meal. Direct their attention to the three focusing questions to guide them in presenting. With your paper plate, model what sharing will look and sound like. You may want to set a two-minute timer, and call out, *Switch!* to set an efficient pace for students to share. Stop at each group, listening to students sharing, and providing support and encouragement. **(15 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *What did you notice the different regions' diets had in common? What was different?*
- *How does what we eat in our community compare to the other foods you learned about today?*

- Which meal would you be most excited to eat? Why?
- What strategies did you and your first group use to decide what would make a balanced meal?
- How did it feel to be the “expert” sharing with your shape groups?

ADAPTATIONS

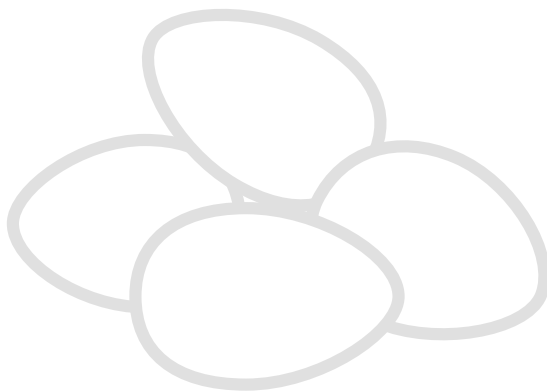
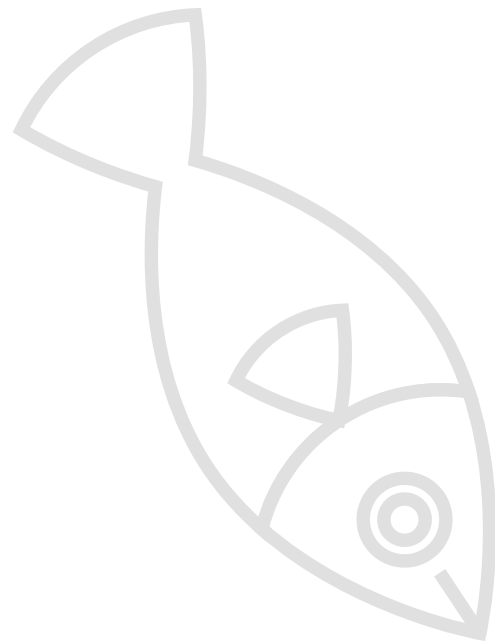
Extension: Have students vote on which paper plate meal they’d most like to eat. Then adapt the idea to make the food as a class. This would be a great opportunity to invite in caregivers or other volunteers from the community who know how to cook foods from cultures outside the United States.

ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards


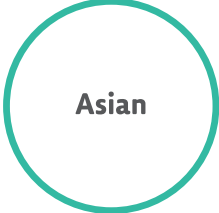



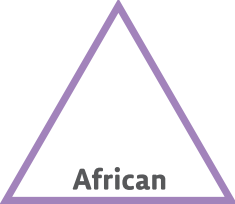
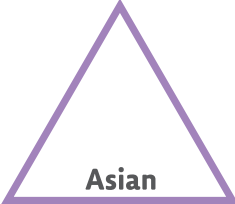

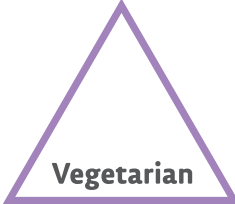














CCSS.ELA-LITERACY.RI.3.5

Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently.



What the World Eats

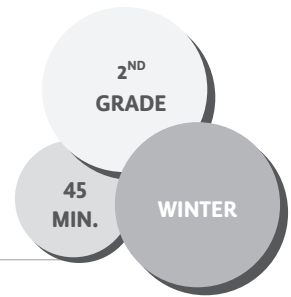
GROUPING CARDS

 <p>African</p>	 <p>Asian</p>	 <p>Latin American</p>	 <p>Mediterranean</p>	 <p>Vegetarian</p>
 <p>African</p>	 <p>Asian</p>	 <p>Latin American</p>	 <p>Mediterranean</p>	 <p>Vegetarian</p>
 <p>African</p>	 <p>Asian</p>	 <p>Latin American</p>	 <p>Mediterranean</p>	 <p>Vegetarian</p>
 <p>African</p>	 <p>Asian</p>	 <p>Latin American</p>	 <p>Mediterranean</p>	 <p>Vegetarian</p>
 <p>African</p>	 <p>Asian</p>	 <p>Latin American</p>	 <p>Mediterranean</p>	 <p>Vegetarian</p>

How Seeds Travel

Adapted from Life Lab's *The Growing Classroom*

THEME: EXPLORING THE ECOLOGY OF FOOD



ESSENTIAL QUESTION

How do seeds travel?

LEARNING OBJECTIVE

✓ Students will be able to explain how seeds are transported through various methods.

LESSON DESCRIPTION

In this lesson, students observe a variety of seeds and use their observations to hypothesize about how the seeds travel. Students then read a book about seed dispersal, and taste pomegranate seeds to reinforce the idea that sweet fruits are adapted to attract animals to eat them.

MATERIALS

- Seed Travel Sorting Cards (pp. 215–216)
- An envelope of a variety of seeds for each group of 4–6 students
- Chart paper or class board
- 2 pomegranates
- Knife
- Bowl of water
- Colander
- Cutting board
- Bowl to hold pomegranate seeds
- Paper towels
- *A Fruit is a Suitcase for Seeds* by Jean Richards

PREPARATION

- › Begin a seed collection in advance of this lesson to use in addition to, or instead of, the sorting cards. Hunt for velcro-like seeds such as burs, helicopter seeds such as maple tree seeds, edible seeds such as pumpkin seeds, and seeds that float such as a coconut. If you aren't able to collect enough for students to sort in small groups, you can display them for students to observe.
- › Photocopy and cut out the Seed Travel Sorting Cards for each group of students, if using.



- › To efficiently cut your pomegranate, score the bottom into six sections. To score, run your knife along the bottom of the fruit just deep enough to pierce the skin. Submerge the pomegranate in a bowl of cold, clean water and break apart, using your hands to peel away the skin and loosen the seeds

underwater. The pith will float on top of the water, and the seeds will settle, while keeping the juices from making a mess. During the lesson, you'll score and loosely break apart the second pomegranate in the same fashion, but keep it intact as a model for students at the beginning of the lesson.

METHODS OF SEED DISPERSAL				
Velcro-Like Seed	Edible Seed (Fruit)	Wind-Dispersed Seed	Water-Dispersed Seed	Explosive (Self-Propelled) Seed
<ul style="list-style-type: none"> • Burdock • Cleavers (bedstraw) 	<ul style="list-style-type: none"> • Grape • Tomato • Raspberry 	<ul style="list-style-type: none"> • Dandelion • Thistle • Maple tree 	<ul style="list-style-type: none"> • Coconut 	<ul style="list-style-type: none"> • Pea pod • Wisteria • Jewelweed

ACTION STEPS

1. How do Seeds Travel?: Gather students in a circle, and explain that today they'll be exploring seeds. Ask students, *What's inside a seed?* (a tiny baby plant). To thrive, a baby plant must travel away from the parent plant to find a spot of its own in which to grow. Explain that you've brought seeds (or pictures of seeds) for them to look at and figure out how the seeds travel. Say, *With your group, sort the pictures based on how you think they travel. For example, you might think, "This seed is shaped kind of like a boat, so I think it floats on water."* Maybe a couple different seeds look similar, so you think they get around the same way. Pass out the Seed Travel Sorting Cards (or envelopes with sets of real seeds) to groups of students, and give them time to sort. Circulate through the room, observing students' sorting and asking questions. **(5 min.)**

2. Sharing: Have groups share their groupings and observations. Ask, *What made you put all those seeds together? What do they have in*

common? How do you think they get around? Make a list of categories students suggest and the seeds that fall within each category. Say, *As we can see, seeds rely on wind, water, and animals to travel and spread their seeds. How do humans help seeds travel?* Briefly discuss how, for years, people have been saving seeds from plants and travelling with them and planting them in new places. Say, *Farmers are really important for planting the seeds for the foods we eat!* **(10 min.)**

3. Reading: Introduce the book *A Fruit is a Suitcase for Seeds*. After reading, ask, *Why are fruits so appealing to eat?* (because they're sweet, juicy, and tasty!) Say, *A sweet fruit can help a seed travel. When an animal eats a fruit, it walks, swims, or flies somewhere else and poops out the seeds. Have you ever seen a bird fly overhead and poop? Have you ever thought, "Hey! That bird just planted a blackberry bush!" This is how sweet fruits help seeds travel.* **(10 min.)**

4. Wash Hands Break! (5 min.)

5. Tasting: Explain that you've brought a special fruit for them to try today. Show students your intact pomegranate. Ask, *Can you guess what is inside?* Take responses and then demonstrate cutting open the pomegranate. Show students the inside contents. Have student volunteers pass out paper towels. Walk around and give each student a small palmful of pomegranate seeds. Ask students to describe the flavor and texture of the seeds. **(10 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: (5 min.)

- Which was the most interesting seed that you saw today? How does that seed travel?
- Why are fruits so tasty and appetizing?
- How is a fruit like a suitcase for seeds?
- How do seeds rely on animals to get around?
- How do seeds rely on wind and water to get around?

ADAPTATIONS

Physical Activity: Play a seed dispersal relay race outdoors. First, introduce a movement to represent each method of seed transport. For example, have the whole class spin like a helicopter for wind transport; have them do the breaststroke with their arms for water transport; have them walk on all fours like a mammal for animal transport; and have them take leap-frog jumps for self-propelled transport. Once students have the various movements and methods committed to memory, have groups of students split in half on either end of the field space. Give a ball representing a seed to each team member starting the relay race. Call out, *On your mark, get set, wind!* and have students travel to their team by spinning like a helicopter to pass off the ball, and so forth.

Garden Setting: Have students look around the garden for seeds, and bring them back to add to the sort.

Math Extension: Pass out a sixth of the pomegranate to small groups of students, and have them estimate how many seeds are in their chunk. They can then practice counting by 2s to check their answer and to determine if they had an odd or even number of seeds.

Literature: If doing this lesson with older students, introduce the Greek myth of Persephone and her mother Demeter, the Goddess of the Harvest, which features pomegranate seeds at the center of the story to explain why we have seasons.

Engineering Extension: Provide students with a variety of building materials, such as pipe cleaners, aluminum foil, empty coffee filters, modeling clay, and the like, and challenge them to build model seeds that can travel by soaring on the wind, floating on water, latching onto fur, or by other means.

ACADEMIC CONNECTIONS

Next Generation Science Standards, Life Science Disciplinary Core Idea

NGSS.LS2.A

Interdependent Relationships in Ecosystems

- Plants depend on water and light to grow.
- Plants depend on animals for pollination or to move their seeds around.

English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.RI.2.1

Ask and answer such questions as *who*, *what*, *where*, *when*, *why*, and *how* to demonstrate understanding of key details in a text.

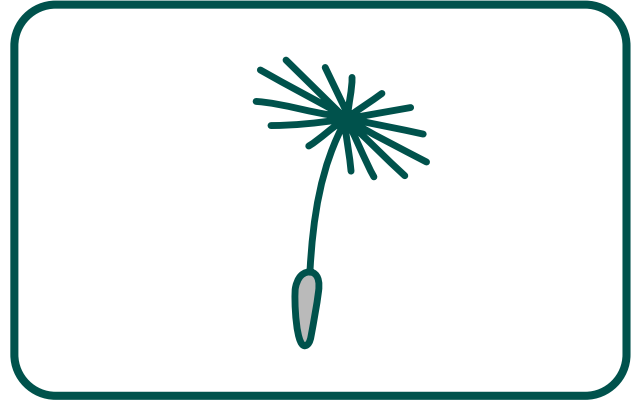
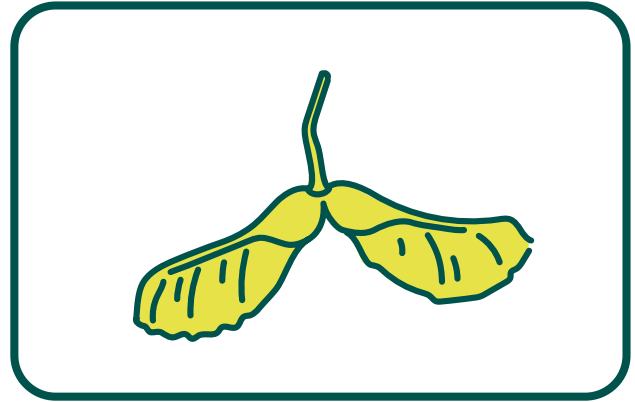
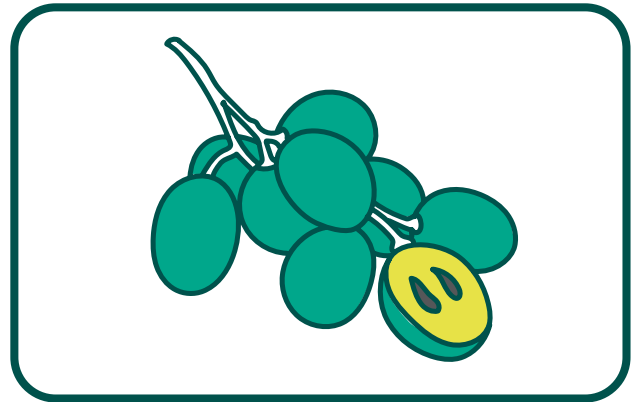
(For the Math Extension)

Math Common Core State Standards

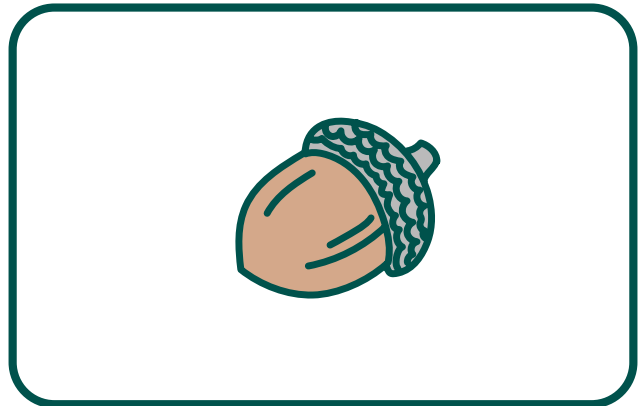
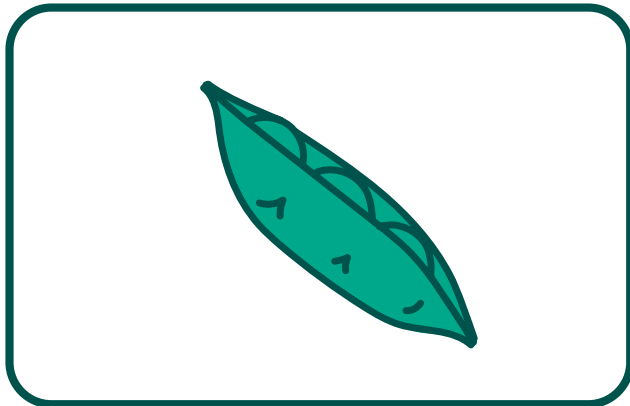
CCSS.MATH.CONTENT.2.OA.C.3

Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.

Seed Travel Sorting Cards

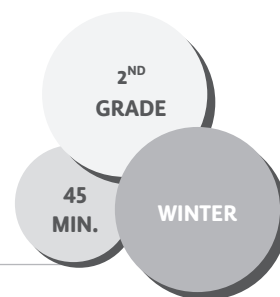


Seed Travel Sorting Cards



Seed Tape

THEME: GROWING AND ACCESSING HEALTHY FOOD



ESSENTIAL QUESTION

How do we plan our planting for success?

LEARNING OBJECTIVE

✓ Students will be able to measure and evenly space seeds.

LESSON DESCRIPTION

In this lesson, students consider the importance of spacing seeds by pretending to be crowded seeds and measuring and creating seed tape.

MATERIALS

- Biodegradable paper, such as brown paper towel, toilet paper, tissue paper, or thin brown paper bags
- Paper cutter or scissors
- Packet of radish seeds
- Packet of carrot seeds
- 2 clear jars with lids
- 2 cups all-purpose flour
- 2 cups water
- Newspaper or vinyl tablecloths to cover tables

For each group of 4–6 students:

- Small dish or jar of paste
- Dish of radish seeds
- Dish of carrot seeds
- Paintbrushes, toothpicks, cotton swabs, or straws
- Rulers
- Pencils

PREPARATION

- › Cover tables with newspaper or vinyl tablecloths.
- › Create a paste by combining equal parts water and flour (2 cups water to 2 cups flour should be sufficient for a class of 30). You should then have a thick paste. You'll want to add a little more water if the paste begins to dry out.
- › Cut your brown paper towels (or other material) into strips 1.5–2 inches wide and 12 inches long. (Or determine the length based on how much seed you have.)
- › Pour a few radish seeds into one clear jar with a lid and a few carrot seeds into the other. Distribute the rest of the seeds into dishes for each group.
- › Check with the classroom teacher, and establish a place for seed tapes to dry once students are finished.

ACTION STEPS

1. Role-Playing Seed Spacing: Gather students in a circle. Say, *Now take two scoots in closer to the circle so we're all really close together.* Then ask students to lift their arms and stretch out carefully. Ask, *Are you able to stretch as much as you'd like? Why not? Say, Plants are just like us. They can't grow as big and healthy and happy as they'd like to if they don't have enough space apart from their neighbors*

(including plants we didn't plant, which is why we weed!). Explain that gardeners often "thin" plants after they've sprouted to make room for them to grow. Have a student walk around the circle, tapping every other student on the shoulder and having that student step out of the circle, as if they've been thinned. Say, *Sometimes we eat plants that we've thinned, but other times they just end up in the compost pile.* Ask students for an alternative solution to thinning. Get to the idea of spacing the seeds farther apart. Have the thinned plants return to the group, and now ask everyone to take three scoots back and try to stretch and grow, pretending they're a plant again. Ask, *Does that feel better?* **(5 min.)**

2. Explain the Activity: Say, *Today we're going to make seed tape, which gardeners sometimes use to make it easier to give their seeds space right from the start. We'll measure how far apart our seeds should be, and we'll paste the seeds onto our paper. In the spring, when it's time to plant outdoors, we'll put our seed tape in the ground, for perfectly spaced root vegetables!* Pass jars of radish and carrot seeds around the circle, and have students make observations, comparing and contrasting them. **(5 min.)**

3. Model: Using the board and some magnets or a document camera, demonstrate for students how to use a ruler to mark their strip of paper every two inches and how to put a dot of paste on each mark, and add one or two carrot seeds on each spot. Explain that it's sometimes okay to put two seeds because not every seed sprouts every time, but if we put more than that, it defeats the idea of making our seed tape. Then show

them how to fold the paper in half over the seed. Say, *It's like we're putting our seeds to bed until it's time for them to wake up in the ground in the spring!* **(5 min.)**

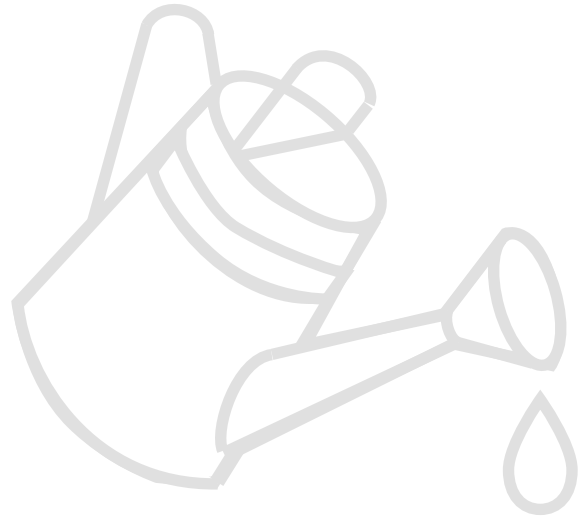
4. Measuring: Have students clear their desks. Pass out a paper strip, as well as rulers and pencils, to each student. Let students decide whether to make radish or carrot seed tape, or assign pairs or tables to make a certain kind. Have students make a mark every inch for the radish and every two inches for the carrots. Incorporate some math. Ask students, *How many carrot seeds will fit onto our strip if they're spaced two inches apart? How many radish seeds fit on the same length? So how many more radish seeds than carrot seeds are we able to plant in the same space?* **(10 min.)**

5. Making Seed Tape: Have groups of students share dishes of paste and dishes of seeds. Remind students to share and only take what they need. Circulate through the room, checking in with students and providing guidance where needed. Remind students to fold the paper over and gently press to secure it and put their seeds to bed. Have students write their names on their seed tape, and show them where to put them to dry. If you intend to plant in the school garden in the spring with these students, let the seed tape dry, and store it in a sealed container. Otherwise, you may want to send students home with their seed tape. If you covered your tables with newspaper, and you have a worm bin, gather and shred the paper to add to your worm bin during cleanup. **(15 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *Why is it important to pay attention to how we space our seeds?*
- *How will our seed tape help us in the spring?*
- *What worked well while making our seed tape? What was challenging?*
- *What do you think it'd be like to plant those tiny seeds outdoors by hand?*



ADAPTATIONS

Follow-Up: In the spring, have students plant their seed tape in the garden. Have students dig a two-inch deep furrow, lay the seed tape down, and gently cover it with soil and water.

Science Inquiry Extension: If you're able to plant in the spring, have students create a control—a seed tape on which the seeds are too close together. Students then have the opportunity to make predictions and observe the different plantings' growth and health over time.

Tasting Extension: With extra time, have students taste-test different varieties of carrots or radishes. You can also try tasting radishes with and without salt, which affects the spiciness of the radish.

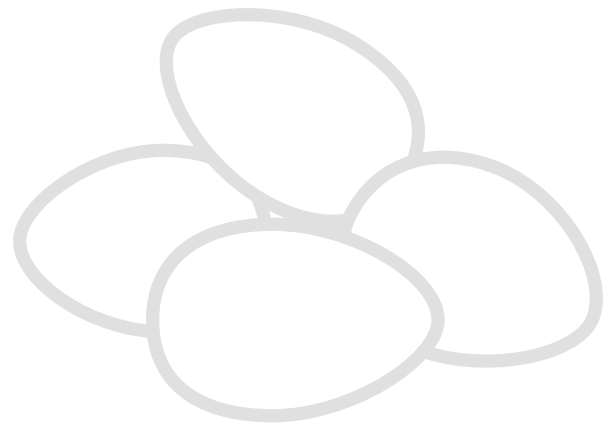


ACADEMIC CONNECTIONS

Math Common Core State Standards

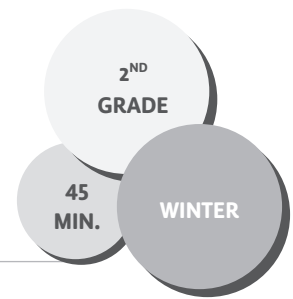
CCSS.MATH.CONTENT.2.OA.C.3

Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.



Sauté

THEME: PREPARING HEALTHY FOOD



ESSENTIAL QUESTION

How can we prepare a healthy dish featuring a variety of vegetables?

LEARNING OBJECTIVES

- ✓ Students will be able to prepare vegetables for a healthy dish.
- ✓ Students will be able to determine the ingredients they prefer using a sauté cooking technique.

MATERIALS

- Induction burner
- Extension cord
- High-heat oil (e.g. canola or sunflower)
- Ingredients for sauce (listed below)
- Vegetables, aromatics, and toppings:

You can sauté with just about any vegetables. See the chart below for some possibilities, but also feel free to use whatever you have available in your region at the time. It is ideal to have at least 1 aromatic and as many vegetables as you like. Toppings are completely optional.

- Bowl of raw vegetables for sampling
- Materials for cleanup

For each student:

- Fork
- Tasting cup
- Sauté Worksheet (p. 223)
- Pencil

Tray of the following for each group of 4–6 students:

- 2–3 cutting mats
- Bowls for vegetables
- Container for compost
- Small cups of toppings

PREPARATION

- › Explore if there are any family or community members who might be interested in joining the lesson to share their cultural cooking technique similar to sautéing.
- › Replicate the illustration of the Sauté process as a poster (optional).
- › Photocopy Sauté Worksheet for each student.
- › Set up a Sauté Station in the classroom with the induction burner, where students can see you cooking.
- › Prepare a sauté sauce. If you have a small enough group, you can prepare the sauce with your students, allowing a different student to measure each ingredient and stir it in.
- › Prepare vegetables that require chopping, such as mincing garlic and slicing carrots.
- › Set aside a small sample of the raw vegetables so each student can try.
- › Set up trays by portioning vegetables students will be preparing, such as chard or broccoli, into bowls and distributing prepared toppings into small cups. Give each group a different vegetable to prepare.

Ingredients for Sauté Sauce

- 3 Tbsp soy sauce
- 1 Tbsp rice vinegar
- 1 Tbsp brown sugar
- ½ cup vegetable broth or water
- 1 ½ Tbsp cornstarch

This sauce is inspired by a stir-fry sauce in Chinese culture.

**POSSIBLE AROMATICS, VEGETABLES,
AND TOPPINGS FOR THE SAUTÉING**

AROMATICS (1–2 tablespoons)	VEGETABLES (4 cups)	TOPPINGS (optional)
• Ginger	• Carrots	• Squeeze of lemon or lime
• Garlic	• Broccoli	• Cilantro
• Shallot	• Cauliflower	• Basil
• Scallion	• Kale	• Sesame seeds
• Onion	• Rainbow chard	• Chopped nuts (check class allergies)
	• Cabbage	
	• Bok choy	
	• Spinach	

ACTION STEPS

1. Engage: Gather students in a circle, and explain, *Today, we're going to make a dish where we cook vegetables in a sauce.* Pass around samples of the raw vegetables (but not aromatics) that they might be using in sautéing. Review the difference between “raw” versus “cooked” vegetables. Have students taste the vegetables, and, after each one, ask: *How would you describe how it tastes?* Explain, *The way we'll cook our vegetables is called sautéing.* Sautéing is a way of cooking vegetables that uses a small amount of oil in a pan over high heat. Ask, *Are there any cooking techniques that your family or culture uses where you cook vegetables over high heat, similar to sautéing?* *We're going to put our vegetables in a skillet with very high heat and cook them really quickly and add a flavorful sauce toward the end. You can cook pretty much any vegetable from the garden this way.* Ask, *How do you think our vegetables will taste differently after we cook them?* **(10 min.)**

2. Wash Hands Break! (5 min.)

3. Demonstrate Vegetable Prep: Model for students how to prepare the vegetables you've brought for them. For example, show them how to break broccoli florets or tear chard or kale into small pieces over a cutting mat. Show them any parts of the vegetable that won't be going into the sauté, and explain that they should put those parts into the compost container. **(5 min.)**

4. Preparing Sauté: Remind students to share with their group. Pass out trays to each group with vegetables to prepare. Once they've finished, show students the Sauté Worksheet and explain, *You'll create a recipe for sautéing vegetables by circling the ingredients you'd like to include, giving your Sauté a name, and writing some directions for cooking this unique dish.* As students are working on their worksheets, begin cooking the aromatics on high heat. After one to two minutes, when the aromatics begin to soften and release their aroma, call up one group at a time to add their prepared vegetables, starting with the sautés that will take the longest to cook. Cook all the vegetables until they're tender but retain a crunch. Add the sauce and toss to incorporate. **(15 min.)**

5. Tasting: Once the sautéed vegetables are ready, pass out tasting cups to students, and have them decorate the top of their portion, with the toppings at their table. Remind them to share the ingredients with the rest of their group and to wait until everyone has their sample before trying. Ask students to describe the flavors. Ask, *How does the flavor compare to how the vegetables tasted before they were cooked?* **(5 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *Why is sautéing a good way to cook garden vegetables?*
- *Would you prefer to eat these sautéed vegetables with rice or noodles?*
- *What vegetables did you add to your sautéed dish?*
- *How would you tell your friend or family how to make sautéed vegetables?*
- *Ask yourself: Did I share with my classmates and help make the dish?*

ADAPTATIONS

Create-Your-Own Version: Instead of making one sautéed dish for the whole class, have small groups work together to choose which vegetables they want to include in their own dish. Then cook them separately, having each group name and present their unique creation.

Older Students: Making a sautéed dish is a perfect opportunity for older students to practice their knife skills. Instead of preparing vegetables to be chopped yourself, demonstrate for students how to chop or slice each vegetable, talking through proper knife safety, and then allowing them to work with knives.

Garden: Have students harvest vegetables from the garden, especially if you did the second grade fall lesson, Plant a Rainbow.

At Home: Have students bring home their Sauté Worksheet to share with caregivers.

ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.SL.2.1

Participate in collaborative conversations with diverse partners about *grade 2 topics and texts* with peers and adults in small and larger groups.



Name: _____ Date: _____

Sauté Worksheet

DIRECTIONS: Circle the ingredients that you'd like to put into your stir-fry!

Name Your Sauté:

Write the directions for preparing your sauté:

1. _____

2. _____

3. _____

4. _____

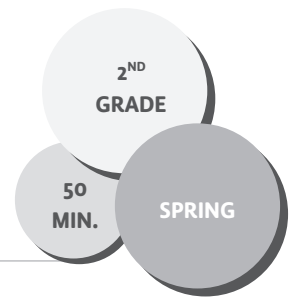
5. _____

6. _____



A Rainbow at the Salad Bar

THEME: MAKING HEALTHY FOOD CHOICES



ESSENTIAL QUESTION

Why is eating a rainbow of fruits and vegetables important?

LEARNING OBJECTIVE

✓ Students will be able to assemble a salad that includes a rainbow of colors.

LESSON DESCRIPTION

In this lesson, students hunt for every color of the rainbow in the cafeteria salad bar, review why eating a variety of colorful fruits and vegetables is a healthy choice, and assemble their own rainbow salad from the salad bar. This lesson is designed to be taught in conjunction with fall lessons Eat a Rainbow and Plant a Rainbow.

MATERIALS

For each student:

- Rainbow at the Salad Bar Worksheet (p. 226)
- Clipboard
- Colored pencils (multiples of each color of the rainbow)
- Poster created by the class from the fall lesson Eat a Rainbow

PREPARATION

- › Coordinate with cafeteria staff for a date and time to host this activity in the cafeteria.
- › Photocopy the Rainbow at the Salad Bar Worksheet for each student.

ACTION STEPS

1. Engage: Gather students in a circle in the cafeteria, and explain that today they're going to go on a hunt to find a rainbow in the salad bar. Say, *Turn and talk to a neighbor, and tell him or her your favorite color of food to eat and why.* **(5 min.)**

2. Rainbow Hunt: Pass out worksheet, clipboards, and colored pencils, and have students circle each color word with the correct color. Then gather around the salad bar. Have them hunt for a fruit or vegetable to represent each color of the rainbow. To help with the flow of students, you might encourage them to sit and draw their produce once they've viewed the salad bar. **(10 min.)**

3. Explain: If you created a poster with the class in the fall, display it now for students to see. Say, *Remember each color helps our body in a different way.* Review with students the idea that eating a rainbow of colors from fresh fruits and vegetables supports our overall health. **(10 min.)**

4. Making a Rainbow Salad: Explain that now they'll go through the salad bar to make a rainbow salad for themselves. Say, *Your challenge is to get as many different colors in your salad as you can.* Have students line up and walk through the salad bar. **(10 min.)**

5. Tasting: Have students sit down and before eating. Ask them to admire their neighbor's

BACKGROUND

Different fruits and vegetables have different phytonutrients, which support our health in different ways. In addition, these phytonutrients give fruits and vegetables their diverse colors. Therefore, by eating fruits and vegetables of different colors, we are also consuming a variety of phytonutrients that can help us stay healthy. The table below shows some of the ways different colors can support our health.

	RED	ORANGE / DEEP YELLOW	YELLOW / BROWN / WHITE	GREEN	BLUE / PURPLE
BENEFITS	Can improve heart strength and skin health	Can promote good vision, especially in the dark	Can make blood healthier	Can strengthen bones and teeth	Can improve memory and promote healthy aging

rainbow salad bar creations, saying, *Eating all the colors of the rainbow is not only good for us but also makes our plates beautiful!* Have students begin eating their rainbow salads together. **(10 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *What did you include in your rainbow salad?*
- *What is your favorite part of your rainbow salad?*
- *What's something new you're trying today?*
- *Based on the poster we made, what part of your body is _____ good for?*

ADAPTATIONS

Classroom Setting: If you don't have access to the cafeteria, you can project a large picture of a salad bar for students to perform the rainbow hunt. Then you can simulate a salad bar in the classroom by bringing in prepped fresh produce and setting it up as a buffet for students to select from.

Garden: If you planted a rainbow garden in the fall, have students harvest a rainbow of fruits and vegetables either for the cafeteria or for the in-class adaptation.

At Home: Have students bring home the Eating a Rainbow at Home Worksheet and fill it out with their caregivers.

ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.SL.2.1

Participate in collaborative conversations with diverse partners about *grade 2 topics and texts* with peers and adults in small and larger groups.

Name: _____ Date: _____

Rainbow at the Salad Bar Worksheet

Directions: Circle each color word with the correct color. Then find all the fruits and vegetables in the salad bar that match each color, and draw them in the blank space.

RED	
ORANGE	
YELLOW/WHITE	
GREEN	
BLUE	
PURPLE	

Eating a Rainbow At Home

I ate a rainbow for

Breakfast _____ Lunch _____ Dinner _____

The dish is called _____.

I person I ate with was _____.

These were the rainbow ingredients in my meal:

Red _____.

Orange _____.

Yellow _____.

Green _____.

Blue _____.

Purple _____.

White _____.

Eating a Rainbow At Home

I ate a rainbow for

Breakfast _____ Lunch _____ Dinner _____

The dish is called _____.

I person I ate with was _____.

These were the rainbow ingredients in my meal:

Red _____.

Orange _____.

Yellow _____.

Green _____.

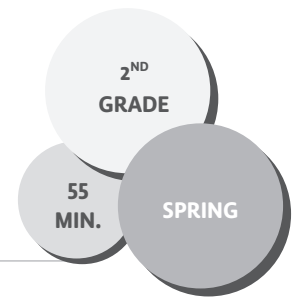
Blue _____.

Purple _____.

White _____.

Be a Bee!

THEME: EXPLORING THE ECOLOGY OF FOOD



ESSENTIAL QUESTION

How do living creatures play a role in the food we eat?

LEARNING OBJECTIVE

✓ Students will be able to dramatize the process of pollination.

LESSON DESCRIPTION

In this lesson, students act out a pollination role-play to understand the important role of pollinators in our food supply.

MATERIALS

- 2 stems of local spring flowers
- *UnBEElievables* by Douglas Florian
- 1 sliced or prepared small piece of fruit for each student (e.g., a pineapple chunk, pear slice, or berry)
- Poster board or other thick, large paper to make costumes
- Markers, crayons, and colored pencils
- Cotton balls
- Masking tape
- Optional:**
- Yarn or string
- Hole puncher
- Library books with colorful pictures of flowers and/or insect wings

PREPARATION

- › Identify a wide-open space where you can play this game, such as outdoors or in a multipurpose room.
- › Cut a set of blank wings out of poster board for half your students.
- › Cut a set of blank flowers out of poster board for the other half of your students.
- › Make your own set of wings and a flower as models for students. Affix a cotton ball with tape onto the center of the flower.

ACTION STEPS

1. Engage: Gather students in a circle, and pass around flowers for students to smell and admire. Ask students, *Why do you think flowers are so beautiful and smell so good?* Field answers, coming around to the idea that flowers have adapted to be attractive and enticing to pollinators. Explain, *Pollinators are insects, birds, and other animals that move pollen among flowers, which allows the plants to produce fruits, seeds and, eventually, new baby plants!* Ask students to name the pollinators they know of (honeybee, hummingbird, bat, beetle, moth, fly). **(5 min.)**

2. Reading: Read a book about pollinators and their impact on our food supply, such as Douglas Florian's *UnBEElievables*. If you are short on time, you may choose not to read all the poems

about bees' different roles, but focus on "Bee Anatomy," "Waggle Dance," "Honey," "Pollen," "Bees Buzz," and "Where are the Bees?" After reading, ask, *How do we depend on bees and other pollinators for what we eat?* Explain to students that in some places we don't see bees as much as we used to. Ask, *What would the world be like without bees?* **(10 min.)**

3. Drawing: Explain, *We're going to play a pollination game, and we need to create our costumes. Half the class will be pollinators and create wings, and half the class will be flowers that turn into fruits with seeds after they're pollinated.* Show students your models, asking them to guess what the cotton balls are for. Explain that if they have a flower, they'll also be drawing a fruit on the back. Pass out art supplies to students and circulate through the room, helping where needed. If you brought in books with photos of flowers or wings, put them in a corner "library" where students can go for inspiration. Help students making flowers attach "pollen" cotton balls with tape. If you have time, you may want to use a hole puncher to attach yarn so students can wear their wings and flowers, rather than hold them. Give students a three-minute warning before it's time to clean up. **(15 min.)**

4. Clean up! (5 min.)

5. Pollination Game: Gather students and bring up two volunteer flowers and one volunteer pollinator to help you demonstrate the game. Say, *When a flower is tagged by a bee, the flower hands over its pollen.* Demonstrate. Now, *let's say a bee is already carrying pollen from a flower. When the bee tags a new flower, it passes the pollen to the new flower,*

and ta-da! Pollination has occurred! The flower now turns into a fruit, and you flip your costume to show the fruit side. Demonstrate. *Once all our flowers have been pollinated and turned into fruit, the game is over.* Ask questions to check for understanding and then play. **(10 min.)**

6. Tasting: Pass out a piece of fruit to each student, emphasizing that this is the result of pollinating all the flowers. Say something like, *Thank you, bees, moths, and bats, for helping plants make this tasty fruit!* **(5 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *How would you explain pollination to a friend or family member?*
- *How does a bee or other pollinator help create our food?*
- *How did it feel to pretend to be a pollinator or flower?*
- *What are ways that we can help bees in our community?*

ADAPTATIONS

In the Classroom: If you are playing this game in a classroom, set parameters to minimize running and maximize safety. In this case, you can say that the flowers are rooted in the ground and can't move, and the pollinators are bees that buzz as they walk but cannot run.

Musical: Add music and dance to the pollination game! Have the pollinators and flowers dance to and from each other. You can even

pause the music sometimes, and make it a freeze-dance game.

Garden Setting: Have students observe bees and other pollinators in the garden, and write poems based on their observations.

ACADEMIC CONNECTIONS

Next Generation Science Standards, Life Science Disciplinary Core Idea

NGSS 2.LS2.A

Interdependent Relationships in Ecosystems
Plants depend on animals for pollination or to move their seeds around.

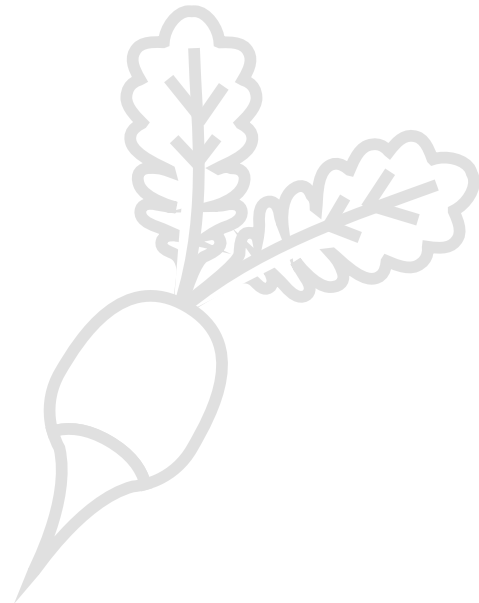
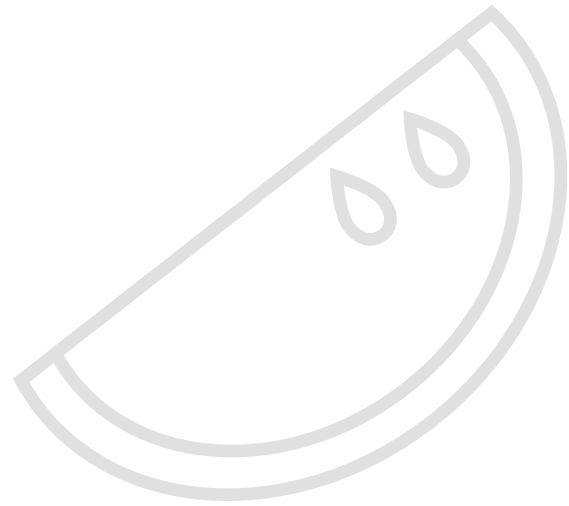
English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.RL.2.6

Identify the main purpose of a text, including what the author wants to answer, explain, or describe.

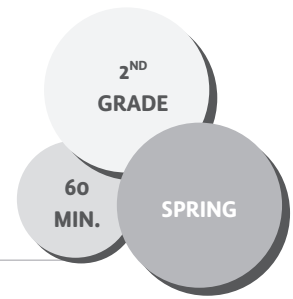
CCSS.ELA-LITERACY.RL.2.4

Describe how words and phrases (e.g., regular beats, alliteration, rhymes, repeated lines) supply rhythm and meaning in a story, poem, or song.



Planting for Beneficial Insects

THEME: GROWING AND ACCESSING HEALTHY FOOD



ESSENTIAL QUESTION

How do plants and animals rely on each other?

LEARNING OBJECTIVES

- ✓ Students will be able to explain the interdependence between beneficial insects and plants in a garden ecosystem.
- ✓ Students will be able to transplant a seedling in the garden.

LESSON DESCRIPTION

In this lesson, students consider the interdependence of plants and animals in the garden through learning about beneficial insects, going on an insect hunt, planting beneficial insectary plants, and collecting data on the amount of pollinators in the garden.

MATERIALS

Insect Hunt:

- 10 Magnifying glasses, magnifying bug viewer cups, or plastic cups

Planting for Beneficials Station:

- 1 transplant for each group of 2–3 students
- Trowels
- Watering cans
- Hose for filling watering cans

Pollinator Count Station:

- Pollinator Count worksheet (p. 234)
- Clipboards
- Colored pencils
- Receptacle for collecting finished worksheets (optional)

Beneficials vs. Pests Station:

- 10–15 Local Beneficials vs. Pests Flash Cards (see following for instructions for creating these)

PREPARATION

- › Identify the beneficial insectary plants that thrive in your region, and check the planting guidelines.
- › Choose an appropriate area to establish your beneficial insectary planting, considering many of these plants are perennial and therefore will return year after year.
- › Research the beneficial and pest insects in your region. Create Beneficials vs. Pests Flash Cards using index cards with a picture of the local critter on the front and information about them on the back, including what plants or other critters they prey on and where you might find them. You'll likely have to make multiple sets of these, so several pairs of students at the station can use them at a time.
- › Set up the Beneficials vs. Pests Station with index cards and any other materials on local beneficial insects and pests.
- › Set up a station for students with the Pollinator Count worksheet, colored pencils, and clipboards. You might also want to include a receptacle for their finished worksheets so they have a place to put them when it's time to switch.

SAMPLE BENEFICIAL INSECTARY PLANTS

- Beebalm
- Buckwheat
- Calendula
- Cosmos
- Dill
- Echinacea
- Fennel
- Lavender
- Lemon balm
- Sunflowers
- Zinnias

ACTION STEPS

1. Engage: Gather students in a circle and ask, *What are ways you help others? What are things you like getting help with?* Discuss responses and then say, *Plants and animals help each other as well. How do plants help us and other animals? How do animals help plants?* Explain that today they're going to consider how we can help the plants and animals in our garden by planting plants that insects like. **(5 min.)**

2. Hunting for Insects: Explain to students that they'll go on an insect hunt to look for insects or other critters that are helpful and those that are harmful in our garden. Ask students, *Which insects or other critters do you think you'll find in our garden today that are helpful to the plants? Which do you think we'll find that are harmful?* Show students what they'll be using to catch and collect their specimens, whether it's an insect box or a paper cup. Elicit ideas for ways that students should be caring toward these living creatures and the garden while they're hunting. For example, discuss putting logs or stones back in place and being calm and still around bees. Pass out insect boxes or cups, and let students know how you'll call them back when it's time. **(10 min.)**

3. Show and Tell: Gather students back in a circle, and have them share about the insects and other critters they found. Ask them to share where they found their critter as well as whether they think their critter is harmful or helpful to the garden. If students brought back their specimens to the circle in closed containers, you could have students pass them around the circle so that everyone gets a chance to see everyone else's. Call out "switch!" every fifteen seconds or so, and have all students pass the containers clockwise. Explain, *Some*

animals help in the garden by decomposing dead plants, such as earthworms and roly polys, or pill bugs. Some help by pollinating plants so they can create tasty fruit, such as bees, butterflies, moths, and flies. Other critters help by eating the pests in our garden. These are ladybugs, beetles, spiders, and centipedes. **(5 min.)**

4. Stations: Explain each station they'll be rotating through, and let them know the signal and how they should clean up when it's time to switch. Divide students into three groups. **(5 min.)**

a. Planting for Beneficials: Show students the plants you've selected, and briefly say the purpose of planting each one. Demonstrate proper tool safety to students as you model planting a start, then have groups of two or three students plant and water a transplant. **(10 min.)**

b. Pollinator Count: Have students or pairs of students take a clipboard, colored pencil, and worksheet and walk around the garden looking for bees and other pollinators. Remind students to stay where you can see them and that bees won't bother them if they stay relaxed. **(10 min.)**

c. Beneficials vs. Pests Study: Have students study the index cards you've prepared at this station. Then students can take turns testing each other. For example, they'd show a picture of the insect and say, "Ladybug! Helpful or harmful?" And have their peer guess. Once students have studied and tested each other, have them perform a second insect hunt to find some of the insects they learned about. Set the expectation that they may not find too

many, but they should see if they can find one beneficial and one pest. **(10 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *What was the most interesting insect you saw today?*
- *Which plants do insects seem to like the most in our garden?*
- *What are the different ways that insects can be helpful in our garden?*
- *How will the plants we planted today help our garden grow and thrive?*
- *Ask yourself: Was I safe and respectful in the garden today?*

ADAPTATIONS

Health Connection: Point out that, just like some insects are good for the garden, there are lots of tiny microorganisms living inside our digestive system (or our gut)! These tiny living organisms help us stay healthy. The best way to have lots of good microorganisms in our bodies is to eat all kinds of plant foods like those found in the garden.

Insect Homes: Discuss the habitats that pollinators and other beneficial insects enjoy, and have students create insect homes using natural materials they find in the garden.

Data Collection Extension: With your class, track the presence of pollinators through the months or seasons. It'll be interesting to compare the presence of pollinators around plants already in your garden (for example, brassicas like kale or broccoli left to flower) versus the plants you planted during this activity.

ACADEMIC CONNECTIONS

Next Generation Science Standards, Life Science Disciplinary Core Idea

NGSS.LS2.A






Interdependent Relationships in Ecosystems

- Plants depend on water and light to grow.
- Plants depend on animals for pollination or to move their seeds around.



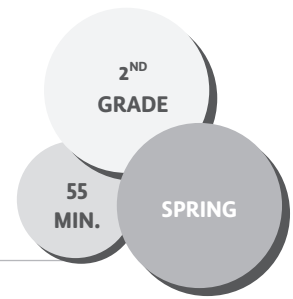
Name: _____ Date: _____

Pollinator Count Worksheet

PLANT	1	2	3	4	5	6	7	8	9	10
Example: ROSEMARY 										
1.										
2.										
3.										

Rainbow Grain Salad

THEME: PREPARING HEALTHY FOOD



ESSENTIAL QUESTION

Why is it important to eat a variety of colorful foods?

LEARNING OBJECTIVE

✓ Students will be able to practice knife skills preparing vegetables for a grain salad.

LESSON DESCRIPTION

In this lesson, students learn knife safety and techniques, observe a demonstration, and practice chopping vegetables in groups for a rainbow grain salad.

MATERIALS

- Fruit and Vegetable Picture Cards (pp. 238–242)
 - Class set of knives
 - Small bowl and fork for each student
 - Portion of each of the vegetables set aside for demonstration
 - Big bowl of a pre-cooked grain such as quinoa, barley, brown rice, couscous, millet, teff, or bulgur wheat
 - Large spoon
 - Materials for cleanup
- Tray of the following for each group of 4–6 students:**
- 1 type of vegetable, portioned into 1 chunk for each student
 - Cutting mats
 - Group bowl for cut veggies
 - Container for compost

PREPARATION

- › Consider recruiting parent or community volunteers for this lesson to have extra eyes and helping hands for students working with knives.
- › Prepare four cups of cooked grains beforehand, following proper food safety guidelines about storing cooked food.
- › Wash all produce, and slice vegetables, so each student has something to work with.
- › Prepare trays for students and your own for demonstration.
- › Make a dressing for the grain salad.

FRUITS AND VEGGIES FROM THE RAINBOW

Red/Pink Strawberry Apple Beet Radish Tomato	Orange Clementine Peach Carrot Bell pepper	Yellow/White Golden beet Parsnip Turnip Daikon radish Corn
Green Kale Collards Rainbow chard	More Greens Celery Cucumber Zucchini Cabbage	Blue/Purple Purple cauliflower Purple kohlrabi

Dressing Recipe

- ½ cup olive oil
- ¼ cup lemon juice
- 1 Tbsp finely chopped herbs (chives and parsley)
- ½ Tbsp minced garlic
- ½ Tbsp honey
- Salt, to taste

ACTION STEPS

1. Engage: Gather students in a circle, and tell them that today they'll be working with knives to create a delicious grain salad with vegetables that are every color in the rainbow. Pass out Fruit and Vegetable Sorting Cards to students in small groups, and ask them to create a rainbow. Ask, *Why do you think it's important to have a rainbow of colors in the foods you eat?* Field responses, and get to the idea that different colored vegetables have all the different vitamins and nutrients your body needs. **(5 min.)**

2. Knife Safety Demonstration (5 min.)

3. Model Vegetable Prep: Show students the vegetables they'll be adding to their grain salad, and model how to cut each type of vegetable. Be sure to go slowly. Exaggerate and highlight the proper techniques you want to see from them. Say things like, *See how I keep the tip on the cutting board the whole time, and I just rock the knife back and forth. See where my other hand is when I'm cutting.* Remind students that you'll be putting all the veggies into a salad, so you want the pieces to be pretty small. If your classroom has a document camera, project your demonstration so all students can easily see. Put your finished samples into small bowls, and give them to students for comparison when they're cutting. **(5 min.)**

4. Wash Hands Break! (5 min.)

5. Chopping Vegetables: Distribute trays to groups of students. You may want to pair students, and explain that each pair will have a chopper and a safety monitor, and they will be trading off halfway through. Circulate through

the room, guiding students to be safe and to use proper technique when needed. Give students a three-minute warning before having them clean their spaces. **(15 min.)**

6. Making the Salad: Call for attention at the front of the room where you have your bowl of grains, spoon, and dressing ready. Have a representative from each group deliver their cut veggies to you. You'll want about one and a half times the amount of veggies to grain. This should work out nicely to four cups of grain to six cups of vegetables, which may mean not using the entire portion of veggies that each group has cut. Toss the salad with dressing, and have a helper distribute it into bowls or tasting cups for each student. Have student helpers pass them out to classmates. During this process, ask students questions to build excitement and anticipation for what they're about to taste. **(10 min.)**

7. Tasting: Ask students to wait until each student has a sample before trying the salad. **(5 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *How might you change this recipe if you were making this at home?*
- *What other dishes could you add rainbow veggies to?*
- *What helpful hints would you share to teach another student how to use a knife?*
- *What makes you proud about using a knife? What do you feel like you still need to work on?*

ADAPTATIONS

Recipe: Have students apply their knife skills to make a rainbow smoothie or a vegetable soup. Or give students big crackers with hummus as a canvas for them to create rainbow veggie art!

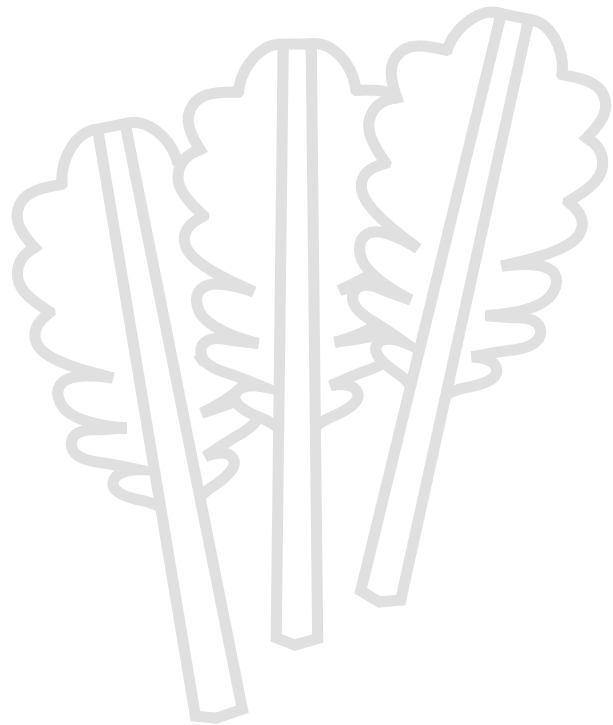
Extension: Read *Rainbow Stew* by Cathryn Falwell.

ACADEMIC CONNECTIONS

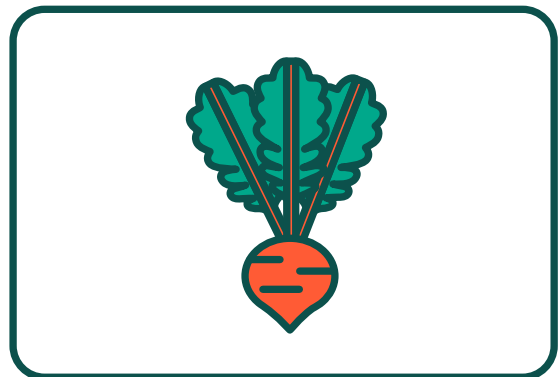
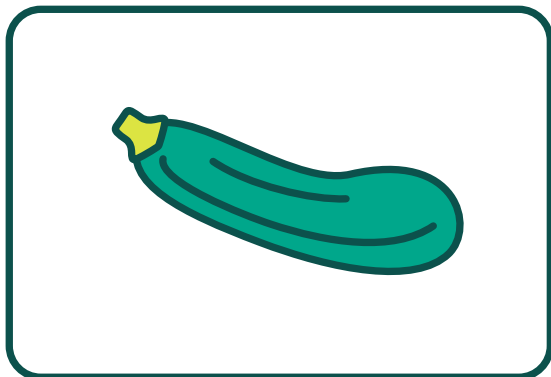
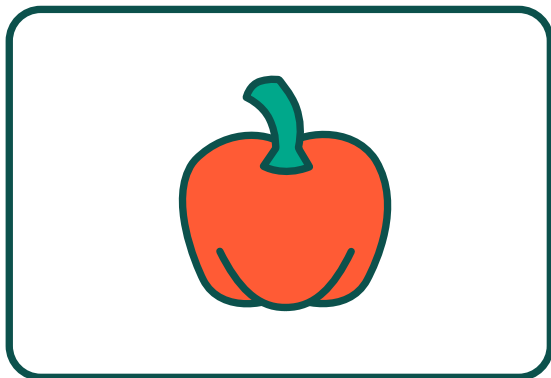
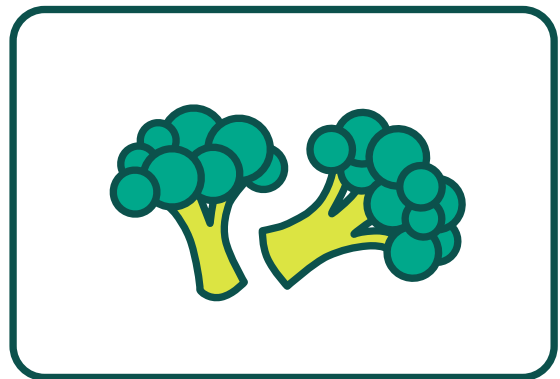
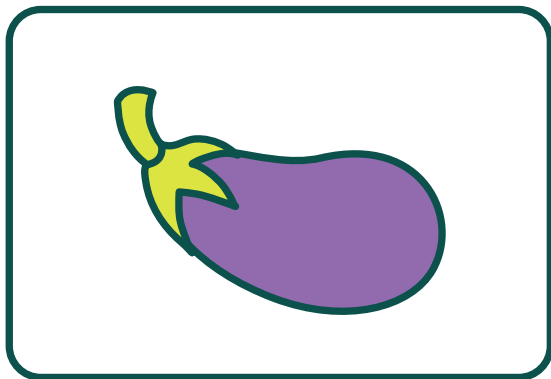
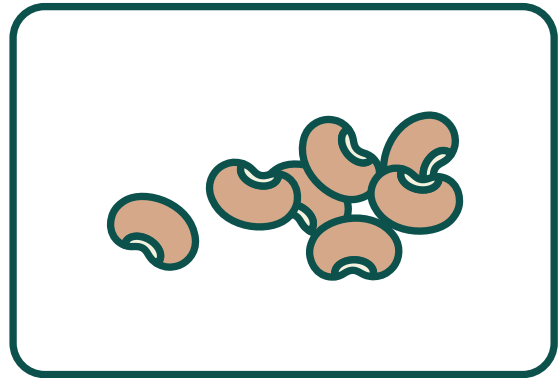
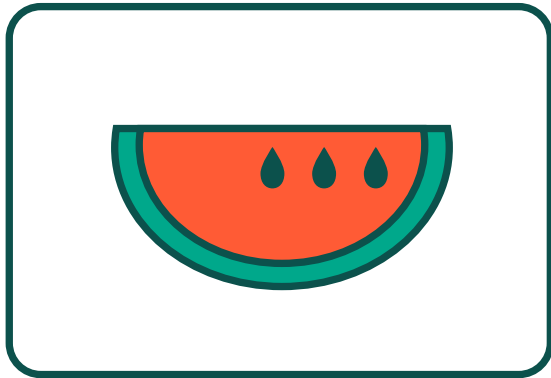
English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.SL.3.1

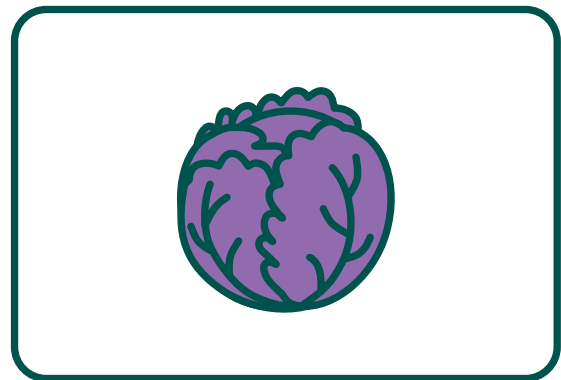
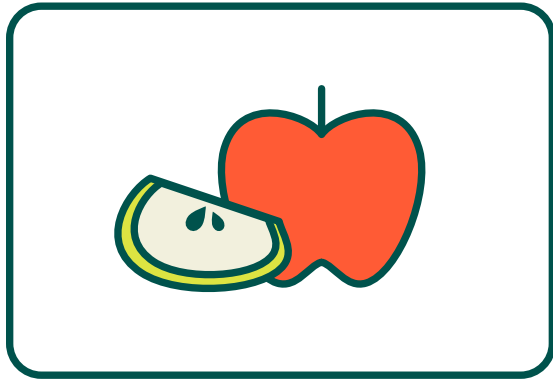
Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 3 topics and texts*, building on others' ideas and expressing their own clearly.



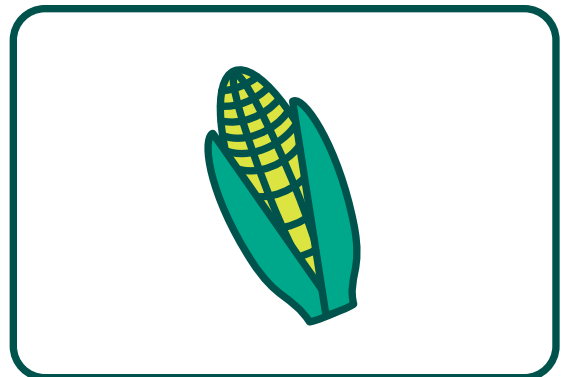
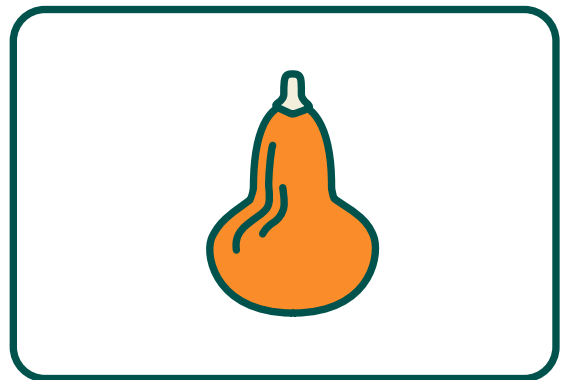
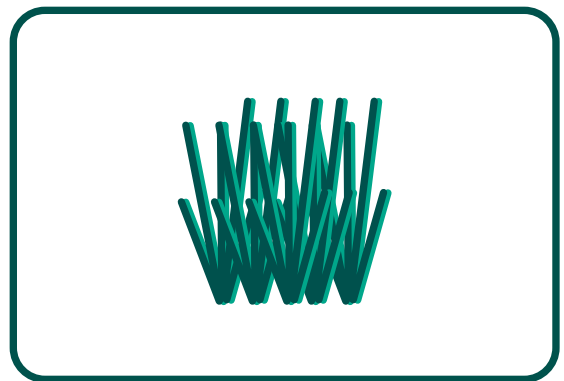
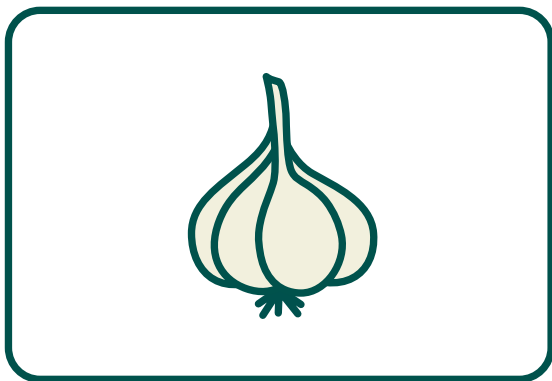
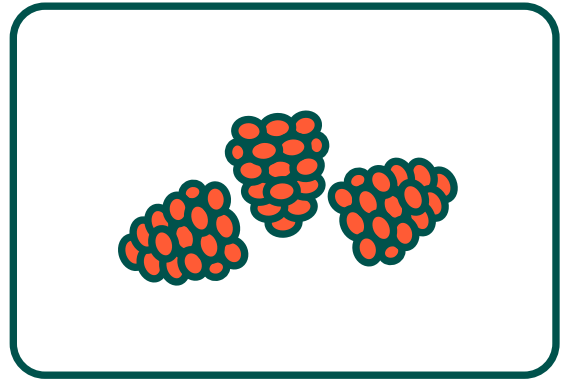
Fruit and Vegetable Picture Cards



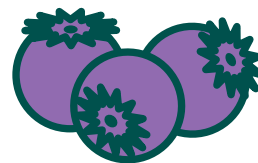
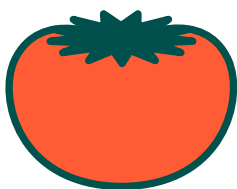
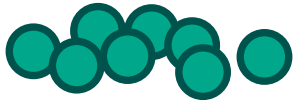
Fruit and Vegetable Picture Cards



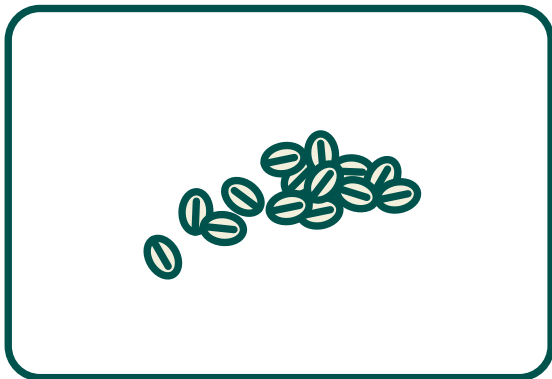
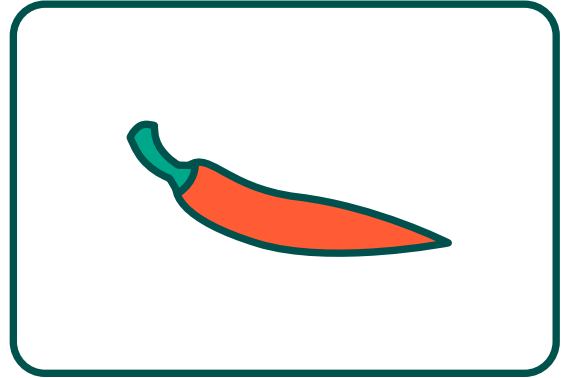
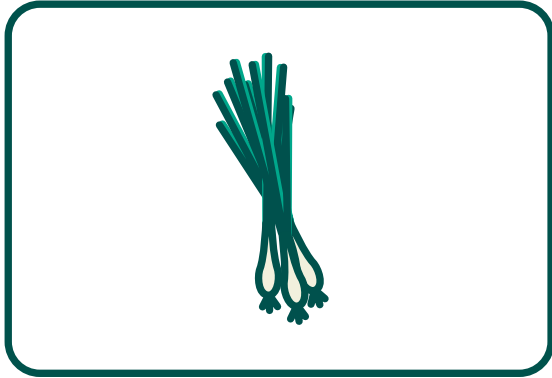
Fruit and Vegetable Picture Cards



Fruit and Vegetable Picture Cards

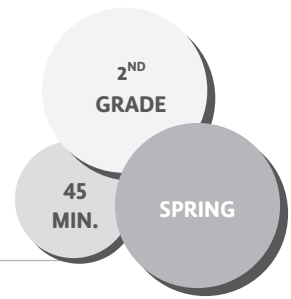


Fruit and Vegetable Picture Cards



Food Story Swap

THEME: CONNECTING FOOD, CULTURE, AND COMMUNITY



ESSENTIAL QUESTION

Why do we like the foods that we like?

LEARNING OBJECTIVES

- ✓ Students will be able to identify their food preferences.
- ✓ Students will be able to synthesize and present information they learn about a peer.

LESSON DESCRIPTION

In this lesson, students explore food preferences by playing the getting-to-know-you game *The Great Wind Blows*, interviewing each other, and sharing information about their partners with the class.

MATERIALS

- Crayons, markers, or colored pencils
- For each student:
 - Copy of the Food Story Swap Worksheet (p. 245)
 - Clipboard (optional)
 - Pencil
 - Drawing paper

PREPARATION

- › Photocopy the Food Story Swap Worksheet.

ACTION STEPS

1. Playing a Warm-Up Game: Have students gather in a circle, and introduce the game, *The Great Wind Blows*. Explain that a person will stand in the middle of the circle and say something that is true for them about food. Give an

example such as, *The Great Wind blows for me and anyone who loves strawberries*. Or, *anyone who helps make their own food*. Explain, *If that's true for you then you need to find a new seat in the circle. If there's no more left, then you're the person in the middle, and they get to say, "The Great Wind blows for me and anyone who . . ."* Remind students of the "Don't yuck my yum" policy. Play several rounds of the game, so a variety of topics are introduced. **(10 min.)**

2. Explain the Activity: Say, *Sharing our likes and dislikes and traditions is a nice way to get to know each other better*. Explain that today they're going to interview each other about food and then share as a class. Remind students, *We all have different taste buds and different experiences, and it's important not to make people feel bad just because they like or do something differently than you*. Pass out interview sheets to each student. Ask for student volunteers to read each question to the class so students will feel confident rereading them while interviewing partners. Explain that you'll set a timer for five minutes for the first partner to ask questions to the other, and then they'll switch for the other person's turn. **(5 min.)**

3. Interviewing Partners: Pair students, pass out clipboards, and allow them to find a comfortable space in the room to interview each other. Tell them they'll get through as many questions as they can in five minutes, but

it's okay if they don't get to all of them. Set the first five-minute timer and then circulate through the room, listening to interviews and offering support where needed. Then let students know when it's time to switch. **(10 min.)**

4. Making Visual Representations: Have students create a visual summary of the information on their interview sheets to share. Have them write their partner's name in the middle, and then illustrate two or more things they learned about their partner. For example, they might draw their favorite snack with a heart around it and the food they try to avoid with an X through it. As students finish, have them partner with other students who have finished to share what they learned about their partner. **(10 min.)**

5. Sharing Circle: Gather students in a circle with their artwork displayed in the middle where everyone can see. Have students take a look and then whisper one thing they learned to someone sitting next to them. Then invite three or four students to share. End the circle with a positive observation about the diversity of responses such as, *It's really interesting to hear all the different ways our class community enjoys eating food.* **(5 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *Why do you think we like certain foods and not others?*
- *What are some fun, interesting things you learned about your classmates today?*
- *What was it like to share about your partner instead of sharing about yourself?*

ADAPTATIONS

Extension: Have students use their interview sheets to write a mini profile of their partner, with two or three sentences they'll decorate. Then bind all the profiles into a class book to enjoy reading together. You might even take pictures of each student to include in the book!

Literacy Extension: Read the book *I Will Never Not Ever Eat a Tomato* by Lauren Child, and have students write and illustrate imaginary stories about their partner's least favorite foods, such as Charlie telling his sister carrots are "orange twiglets from Jupiter," and peas are "green drops from Greenland."

At Home: Make extra copies of the worksheet for students to bring home and interview a family member.

ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.SL.2.1

Participate in collaborative conversations with diverse partners *about grade 2 topics and texts* with peers and adults in small and larger groups.

CCSS.ELA-LITERACY.L.2.5

Demonstrate understanding of word relationships and nuance in word meanings.

CCSS.ELA-LITERACY.L.2.5.A

Identify real-life connections between words and their use (e.g., *describe foods that are spicy or juicy*)

Name: _____ Date: _____

Food Story Swap Worksheet

› What is your favorite food to eat for breakfast?

› What is your favorite snack?

› What do you eat at home for dinner?

› Do you know of a food tradition that's important in your culture or community?

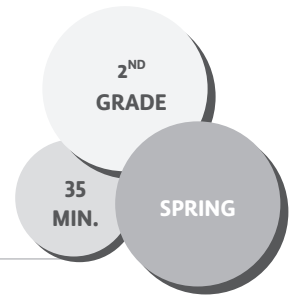
› What's a food you don't like to eat? Why?

› What's a food you've never tried? Why not?

› What is your favorite food memory with someone you love?

Insect Homes

THEME: EXPLORING THE ECOLOGY OF FOOD



ESSENTIAL QUESTION

How can we create a habitat for the important creatures in our garden?

LEARNING OBJECTIVES

- ✓ Students will be able to explain the importance of habitat for living creatures.
- ✓ Students will be able to build habitats in the garden appropriate for insects.

LESSON DESCRIPTION

In this lesson, students will learn what makes an appropriate insect habitat, and then construct homes in the garden. This lesson can be taught in conjunction with lessons “Be a Bee!” and “Planting for Pollinators.”

MATERIALS

- How to Build an Insect Home poster
- Natural building materials (see Preparation below)
- Craft materials for welcome signs such as cardboard, found sticks, and permanent markers of various colors

PREPARATION

- › Create a model insect home.
- › Create a model welcome sign.
- › Photocopy How to Build an Insect Home poster.

- › Gather some natural and found materials for students to use to make their insect homes such as twigs, straw, bamboo, twine, stones, old cement pavers, toilet paper tubes, etc.
- › Set up two stations in the garden: One where students will access the insect home materials and one where they will access the welcome sign materials.

ACTION STEPS

1. Engage: Gather students in a circle, and hold up your model insect home and ask, *What do you think this might be? (It’s a home for insects!) What about this object might make it a good home, or habitat, for garden insects?* Tell them that today they’ll get to be architects and builders for the living creatures in our garden. Ask, *If you were an insect, what kind of home would you like to have? What would you need to have in your home or nearby?* Have students turn and talk to their neighbor and then discuss as a class. **(5 min.)**

2. Explain the Activity: Remind students, *There are many helpful insects that help our garden grow and thrive. We call these beneficial insects. In what ways can insects help our garden? If insects have a safe, comfortable space to live, with easy access to the things they need, we’ll likely have more and more of them in our garden!* Display the How to Build an Insect Home poster, and go over steps. **(5 min.)**

3. Building Insect Homes: Before setting students free, go over places where students can build and places that might be off limits for students. Also discuss materials in the garden that students may harvest or utilize for their buildings. You might give students the option to work independently or in pairs or triads. As students are building, walk through the garden to ensure they're working safely, and provide guidance and support to those who need it. **(15 min.)**

4. Making Signage: Encourage students who finish early to make a welcome sign for the beneficial insects in the garden, such as "Make Yourself at Home" or "Help Yourself to the Flowers!" **(5 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

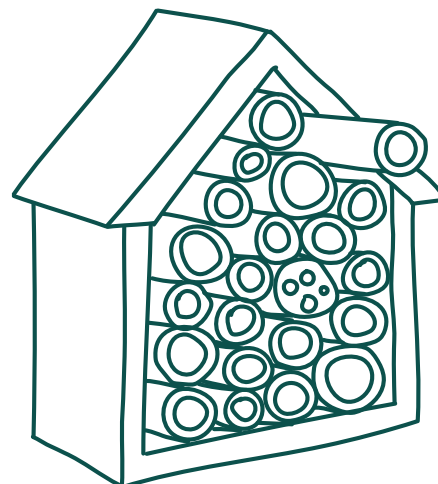
- *Why is it important for living creatures to have a habitat?*
- *How does it benefit us to create a home for the living creatures in our garden?*
- *What did you include in your home that you think will attract insects?*

ADAPTATIONS

Large-Scale Variation: If you have permission at your school to create a more permanent structure, your group can create an Insect Hotel! Prepare by stacking wooden pallets and/or cinder blocks horizontally in your designated area. Then, during class time, have students stuff materials into various parts of the structure.



Mason Bee Extension: To make mason bee hotels, have students, supervised by adults, take turns drilling holes into wood blocks. The holes should be 6" deep and 5/16" wide.



Insect Food Extension: Bring in reference materials showing what different insects eat, and then invite students to gather insect food for their insects and place it in or around their homes.

Take-Home Extension: Give each student a toilet paper roll, and invite them to build a small insect home inside it to take home to increase insect habitats around students' homes.

Follow-Up: A month after building insect homes, have students perform a census, going around to the different insect homes to see

who has taken up residence. Have students identify and count each living creature and then create a class chart.

ACADEMIC CONNECTIONS

Next Generation Science Standards, Life
Science Disciplinary Core Idea

NGSS LS4.D

Biodiversity and Humans

There are many different kinds of living things in any area, and they exist in different places on land and in water. (2-LS4-1)

NGSS K-2.ETS1.B

Developing Possible Solutions

Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people (K-2-ETS1-2)

How To Build An Insect Home

STEP 1

Find a good spot

- cool
- moist
- shady
- protected



STEP 2

Create a structure

USE FOUND STICKS, CARDBOARD OR PALLETS



Shady tree roots

Shady bush

Pallet

Bricks

Paper towels

STEP 3

Fill with gathered materials



VACANCY

BUG HOTEL



DEAD WOOD & ROTTING BARK | Where beetles, centipedes, spiders, and woodlice love to be



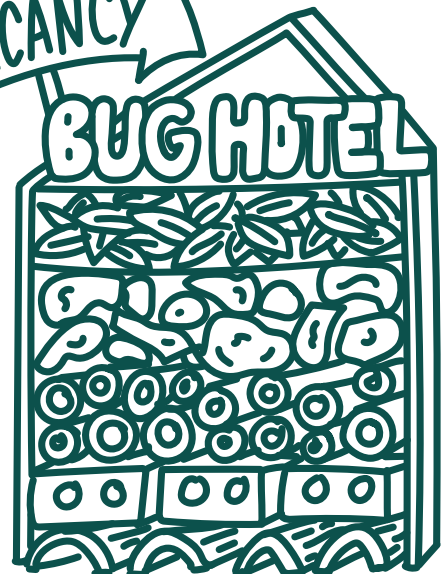
HOLLOW STEMS | For solitary bees



STONES & TILES | Cool, moist place for newts and frogs



DRY DEAD LEAVES | Warm place to burrow





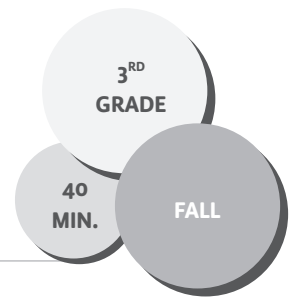
The background of the page is a light gray color with a repeating pattern of various fruits and vegetables. The items include watermelon slices, lemons, carrots, broccoli, mushrooms, and other produce, all rendered in a simple, line-art style. A large white circle is centered on the page, containing the main title.

Third Grade

LESSONS

All in for Applesauce

THEME: LIVING UP TO OUR FULL POTENTIAL



ESSENTIAL QUESTION

How can we pay close attention to our surroundings and each other?

LEARNING OBJECTIVES

- ✓ Students will be able to closely observe apples and describe them in detail.
- ✓ Students will be able to articulate how diverse varieties of produce contribute to a flavorful applesauce and how diverse people contribute to a vibrant community.

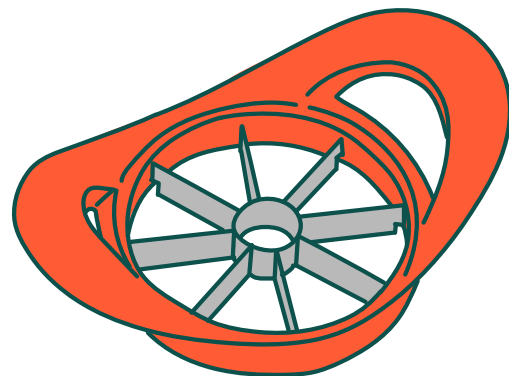
LESSON DESCRIPTION

In this lesson, students test their close observation skills by studying one apple and then trying to identify it among other apples. They then reflect on the importance of diversity in a community and have a taste test of homemade applesauce.

MATERIALS

- 1 apple for each student of varying varieties (or each pair of students if you have a large class)
- Applesauce ingredients
- 4 bowls
- Pot
- Hot plate
- Extension cord
- Flexible cutting mat for each group
- Long wooden spoon
- Potato masher (or immersion blender, if you have one)
- Paper and pencils or pens for all students

- Chart paper or a whiteboard with markers
- Tasting cup for each student
- Spoon for each student
- 2 apple corers (optional)



PREPARATION

- › Divide the apples into bowls for each group of three students.
- › Set up a station where you can plug in the hot plate, and small groups of students will be able to gather around to make applesauce. Have a couple of cutting mats and apple corers set out for students to use.
- › Have a couple of apples already sliced and ready to start cooking to help the process along. No need to peel them.
- › Write the following prompt on chart paper or a whiteboard where all students can see: “Diverse varieties of apples contribute to a flavorful applesauce. How do diverse people contribute to a vibrant community?”

Applesauce

- 10 apples of different varieties
- Juice of 1 lemon
- Tbsp of cinnamon
- Pinch of salt
- 1 cup of water, if needed

ACTION STEPS

1. Wash Hands! (5 min.)

2. Sensory Observation: Divide students into groups of three, and pass out an apple to each group. Ask students to observe closely, saying, *What if this apple were the world? I want you to observe every nook and cranny, finding all the mountains, all the cities, and all the farms. Where are the oceans? Where are the rivers? Can you find where we live? Can you find your home?* Give students time to observe their apples. (5 min.)

3. Finding Your Apple: Say, *You're going to test your close observation skills by placing your apple back in the bowl with everyone else's to see if you can find it again.* Give students one more minute to notice any unique markings or other characteristics of their apple. Then have students place their apples back in the bowl. You might want to go around and rearrange some of the apples in the bowls so students can't easily find theirs again. Announce, *When I say "applesauce" you're going to find the original apple that you studied so well.* Have students hunt for their apple. (5 min.)

4a. Making Applesauce: Explain to students that the class will be making applesauce

using the different apple varieties they just studied. Say, *Some apple varieties taste sweet and others are tart, so they each contribute something unique to the applesauce.* Call up groups one at a time to contribute to the applesauce. Have each group of students use the apple corer to slice and core one apple, toss it into the pot, and stir or mash the apples.

4b. Writing Activity: While the applesauce is cooking, have students write responses to the following prompt: *Diverse varieties of apples contribute to a flavorful applesauce. How do diverse people contribute to a vibrant community?* Before they begin, explain that "vibrant" can mean exciting, strong, and lively. If your applesauce still needs more time to cook after the writing activity, you might include one of the extensions below. (15 min.)

5. Tasting: Pass out a tasting cup of applesauce to each student. Ask students to use adjectives to describe the taste and texture of the applesauce. (5 min.)

REFLECTION

Have students discuss the following questions in small groups, then share with the class: (5 min.)

- *What flavors did you taste in the applesauce?*
- *Why do you think we added many different types of apples to our applesauce rather than just using one type?*
- *Similar to our diverse apples creating a flavorful applesauce, how do diverse people contribute to a vibrant community?*

ADAPTATIONS

Garden: If you have a bountiful crop in your school garden, such as cherry tomatoes, you can adapt this activity so students are closely observing the crop that they can then harvest.

Extension: Have pairs of students sit together back-to-back. Demonstrate how to draw an object based on another person's description, explaining, *One person will hold the apple and explain it with as much detail as possible. Meanwhile, the other partner will be drawing what they hear the partner describing.* Have students try the activity, then switch apples with other pairs, switch roles, and try again.

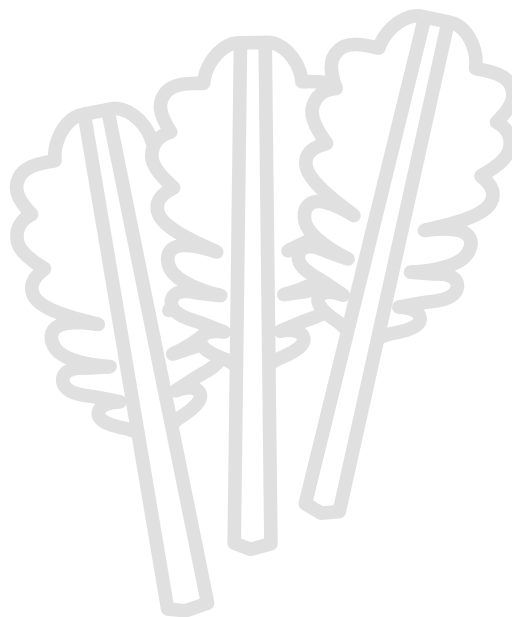
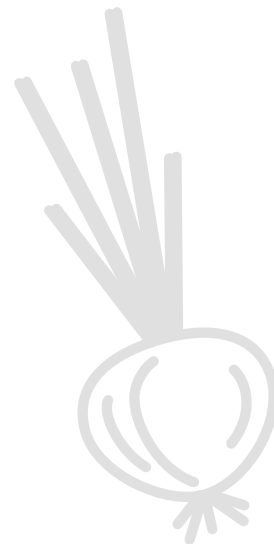
Geography: Use one apple as a model of the world. Slice it into quarters, and explain that three-fourths of Earth is covered in oceans and seas. Remove those sections. Then take the remaining one-fourth, and explain that that's the land. Chop that in half, and explain that half of the land is inhabitable, and the other half is uninhabitable. Remove the uninhabitable half. Now take the remaining apple slice, and chop it into fourths. Explain that only one-fourth of our inhabitable land is arable (or farmable). Remove all the other parts. Use this to discuss how precious our arable land is.

ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards

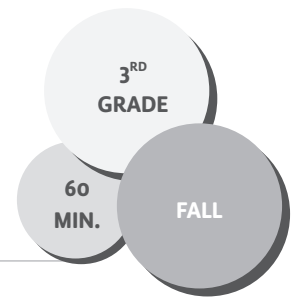
CCSS.ELA-LITERACY.L.3.5

Demonstrate understanding of figurative language, word relationships and nuances in word meanings.



Get to the Source

THEME: MAKING HEALTHY FOOD CHOICES



ESSENTIAL QUESTION

How can we tell the difference between whole foods versus processed foods?

LEARNING OBJECTIVES

- ✓ Students will be able to draw connections between common foods and their sources.
- ✓ Students will be able to interpret the information on a nutrition label to identify whole, minimally processed, and highly processed foods.
- ✓ Students will be able to articulate the health benefits of eating whole and minimally processed foods.

LESSON DESCRIPTION

In this lesson, students play a game to identify foods and match them to their sources. They then learn the definition of minimally versus highly processed foods and, in groups, apply that understanding to sort various food products that share an original, whole food source.

MATERIALS

- Tape or glue
- Matching Food Source Cards (pp. 259–262)
- 5 sets of Processed Spectrum Sets (pp. 263–267)
- 5 zip lock bags (or other container) to hold food source sets
- 5 pieces of chart paper (1 for each group)

PREPARATION

- › Photocopy and cut out Matching Food Source Cards.
- › Photocopy and cut out Processed Spectrum Sets, and put each set into a zip lock bag.

ACTION STEPS

1. What Food Am I?: Have students gather in a circle. Explain, *I'm going to tape a picture of a food onto each of your backs. Then we're going to play a game called "What Food Am I?" where we have to ask each other yes/no questions to figure out what we have on our backs. For example, I could ask "Am I fruit?" Or "Do I come in packaging?" Or "Am I spicy?" Could I ask "What color am I?"* (No, because that's not a yes/no question). Tape a food image to students' backs, making sure their match is in the mix. Remind students to keep the foods they see on their classmates' backs a secret and that the game isn't fun if we give away the food without the person guessing. Start the game and have students walk around the room, asking each other yes/no questions. If a student guesses their food, the student can move the card onto their front and continue answering questions for other players. Model with the classroom teacher as your partner before the game starts. Give students about five minutes to play and then call them back into a circle. **(10 min.)**

2. Connecting to the Source: Ask, *What did you notice about the different types of food pictures we had? Say, You might have noticed that some of you were whole foods, like a fruit or vegetable, and some of you were food products, things to eat that you make from whole foods. A whole food is food in its natural state that has been processed as little as possible, like a tomato, a berry, or corn, whereas a product is something you make with a whole food, like jam or french fries, and it might come in packaging if you buy it at the store.* Explain that now that they know what foods they have, they're going to stand up and try to find their match. Each food product has a whole food source match. For example, orange juice would match to an orange. Tell students once they find their match they should return to the circle to sit with their partner. Give students about five minutes or until everyone is back in the circle, and have pairs share how they know they're a match. **(10 min.)**

3. Defining Processed Foods: Say, *Raise your picture up in the air if you could be taken straight from a garden or farm. You're all the whole foods! Raise your picture up in the air if a person has to do some work to make you. You're all the food products or processed foods! What does it mean to be processed?* Field responses from students, and get to the idea that a processed food has been changed from its original form. Explain that people process foods by mashing them, cooking them, or blending them with other ingredients. This makes the food more convenient to eat, helps the food last longer, or changes the food's taste or texture. Explain, *There is a whole spectrum of food products from minimally to highly processed foods. Foods that are minimally*

processed are still really close to their original food source. For example, applesauce can be as simple as apples cut up and cooked down with nothing else added or maybe just a little cinnamon, lemon, and sugar. But the more original food is changed, and the more ingredients that are added to it, the more highly processed it becomes. (5 min.)

4. Reading Nutrition Labels: Show students a copy of the nutrition label for peanut butter. Explain that the first ingredient listed is what the product has the most of, and the ingredients go in decreasing order. Say, *The more ingredients you see listed there, the more highly processed the product is. Also, if you see ingredients like "diglycerides," that you don't recognize or have trouble pronouncing, that probably means it's a chemical ingredient to change the color or texture or a preservative to make the product keep on the shelf longer. (5 min.)*

5. Sorting Processed Spectrum: Show students one of the Processed Spectrum Sets, and explain that they'll arrange the pictures of foods from whole foods, to minimally processed, to highly processed. Have the students tape or glue their food pictures in order on chart paper. Tell students to be ready to explain why their group ordered the foods the way they did. Divide students into five groups, and pass out a bag to each group. As they sort their food items, circulate through the room, asking probing questions and encouraging students to read the ingredients lists. **(10 min.)**

6. Gallery Walk: Have groups display their spectra for the class. Then have students circulate through the room, observing other groups' arrangements and writing questions

or comments on post-its that they add to each spectrum. Then have each group share their spectrum and answer any questions that arose. **(15 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *Why is it important to distinguish between minimally and highly processed foods?*
- *How can you tell if something is a whole food?*
- *How can you tell if something has been processed?*
- *How did your group decide that a food was more processed than another food?*

ADAPTATIONS

Variation: Play a version of the game in which half the students have a food product and the other half have ingredients lists, and students must find which product they think they are based on their ingredients list.

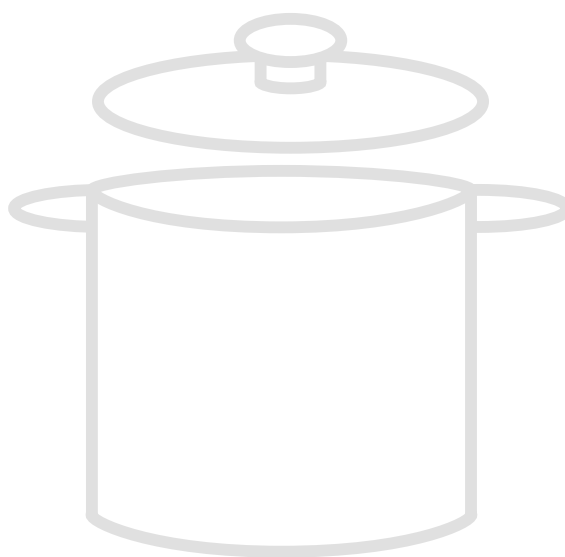
At Home: Have students record snacks and meals they eat during the week, and label where each food falls on a whole versus highly processed spectrum.

ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.RI.3.9

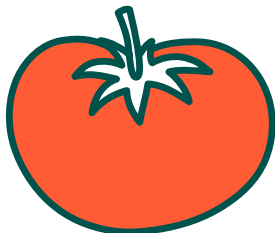
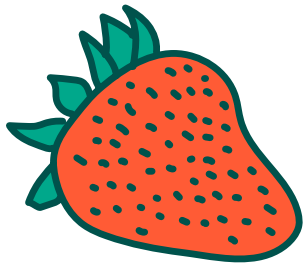
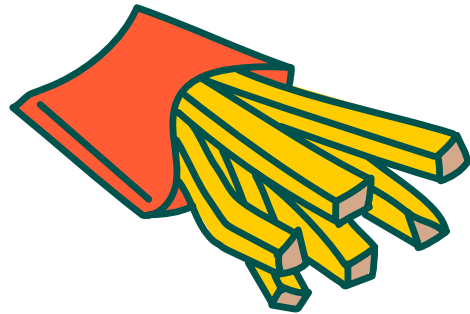
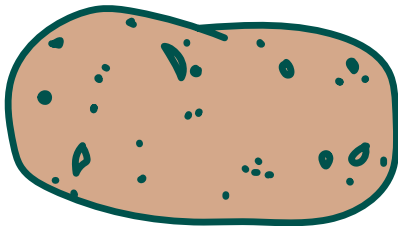
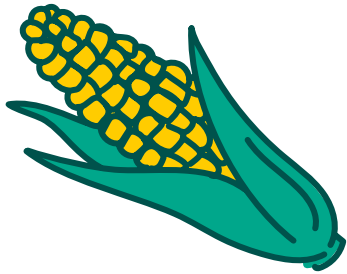
Compare and contrast the most important points and key details presented in two texts on the same topic.



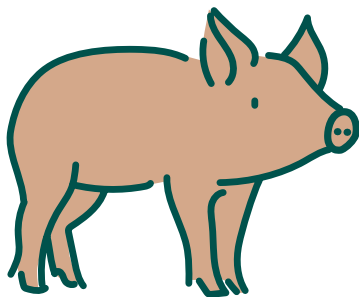
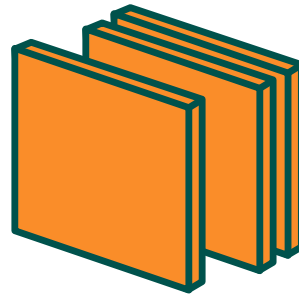
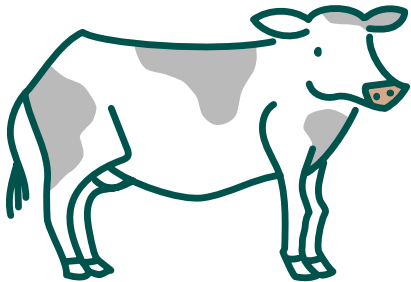
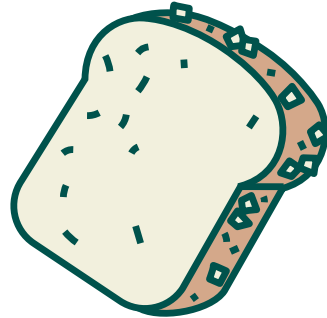
PEANUT BUTTER INGREDIENTS LIST:

**Roasted peanuts and sugar, contains 2%
or less of: molasses, fully hydrogenated
vegetable oils (rapeseed and soybean),
mono and diglycerides, salt**

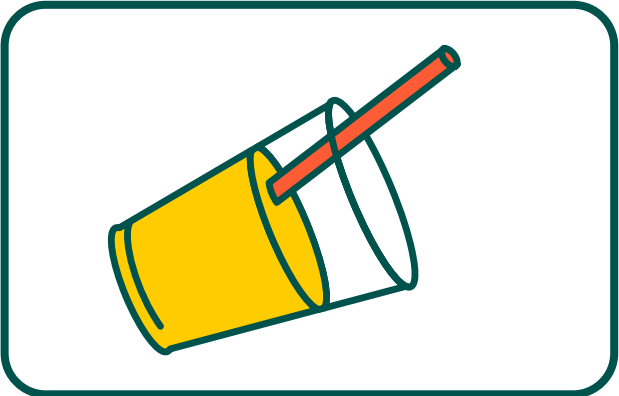
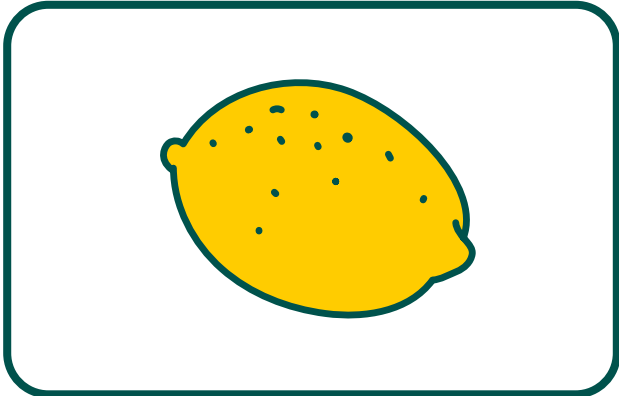
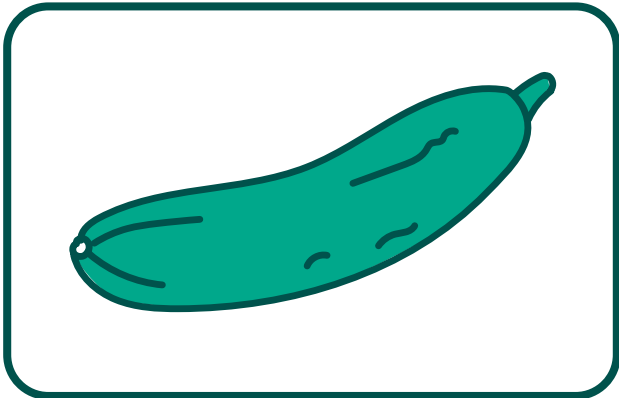
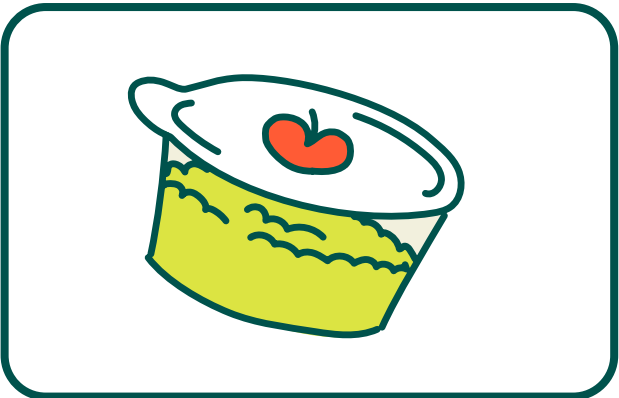
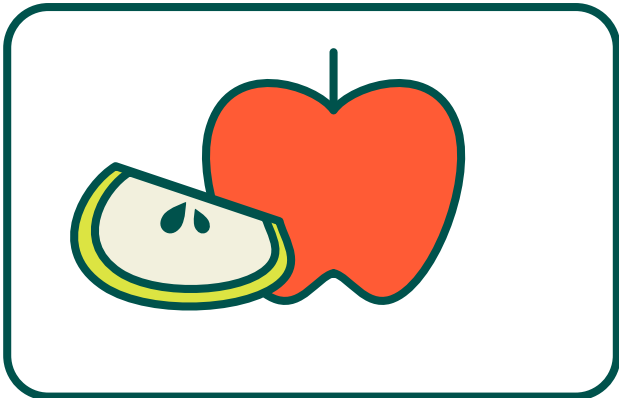
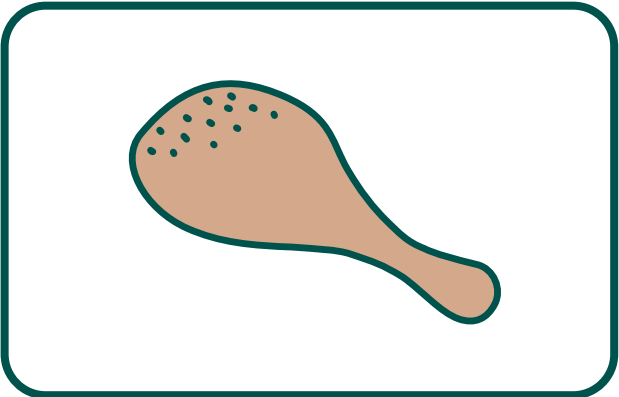
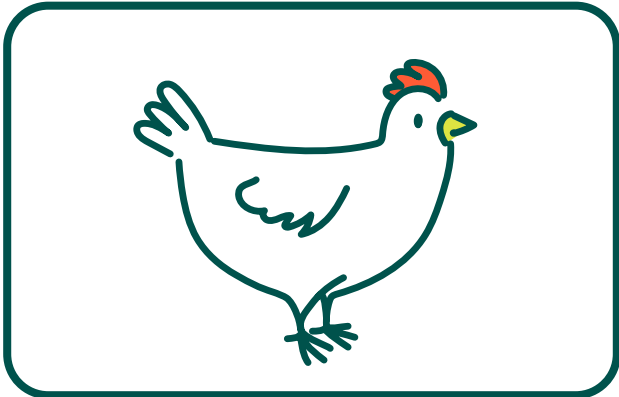
Matching Food Source Cards



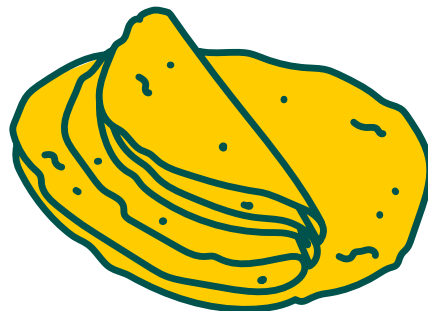
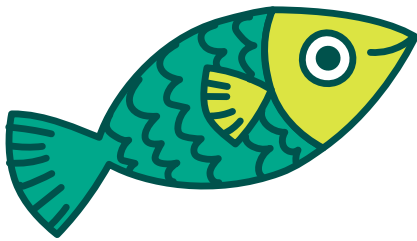
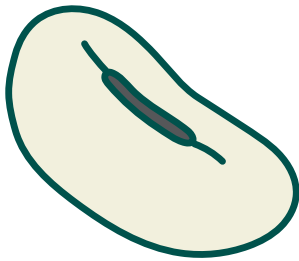
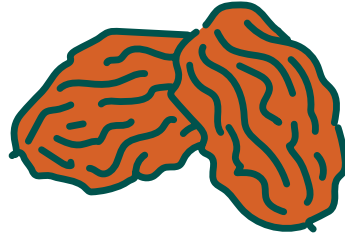
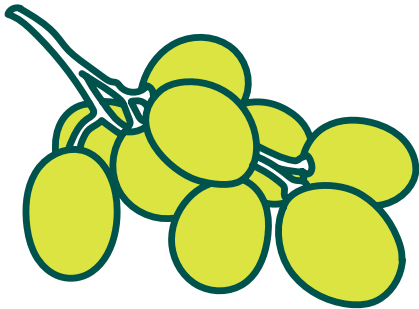
Matching Food Source Cards



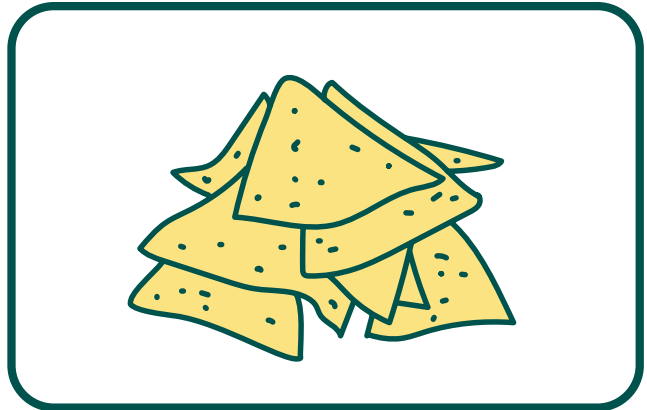
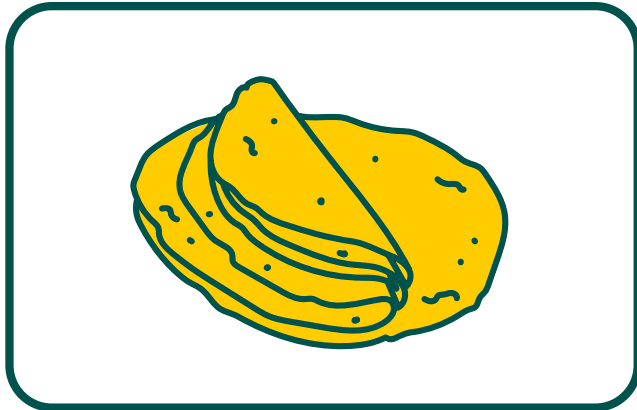
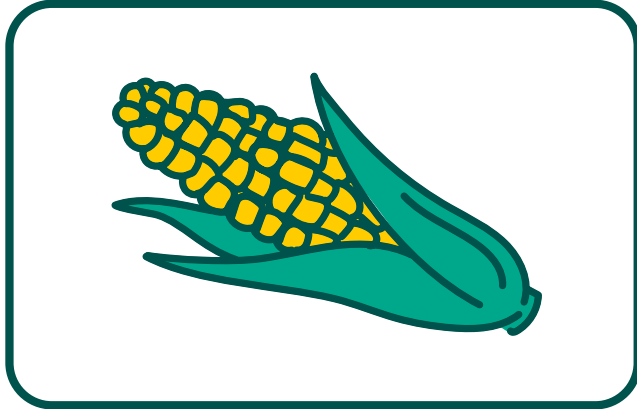
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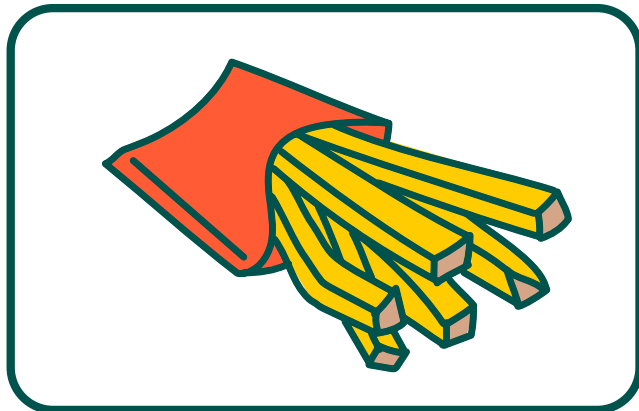
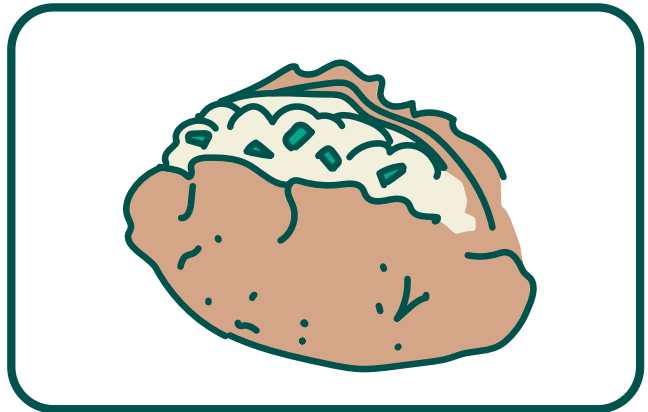
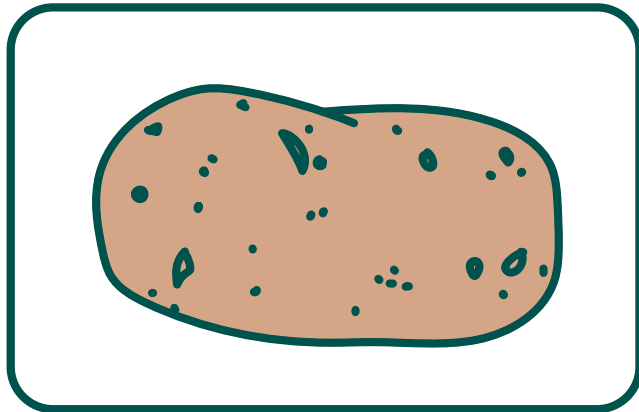
Matching Food Source Cards



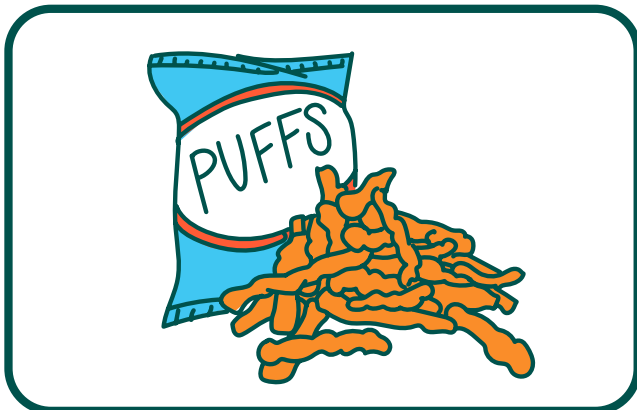
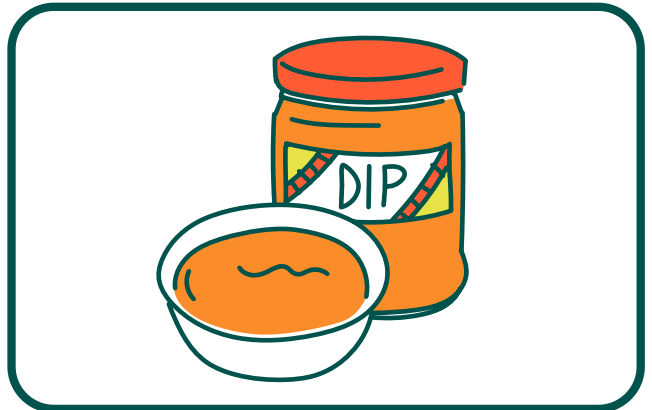
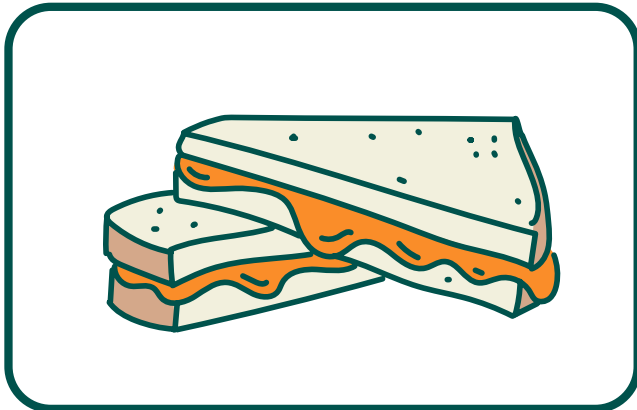
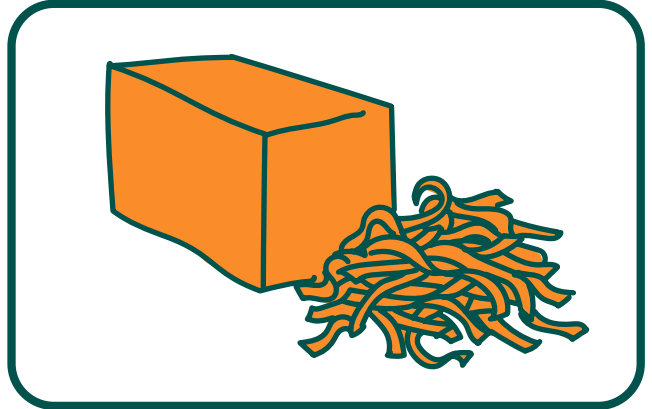
Processed Spectrum Sets



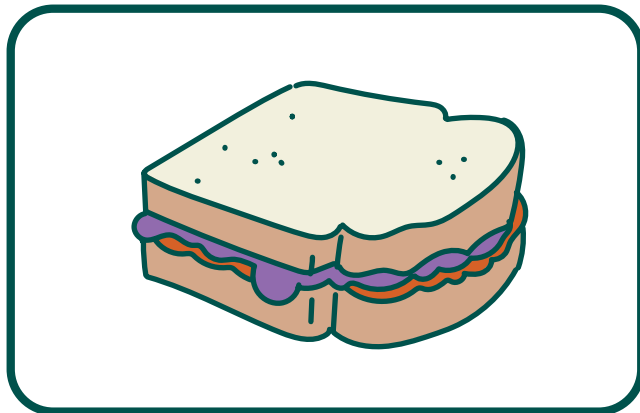
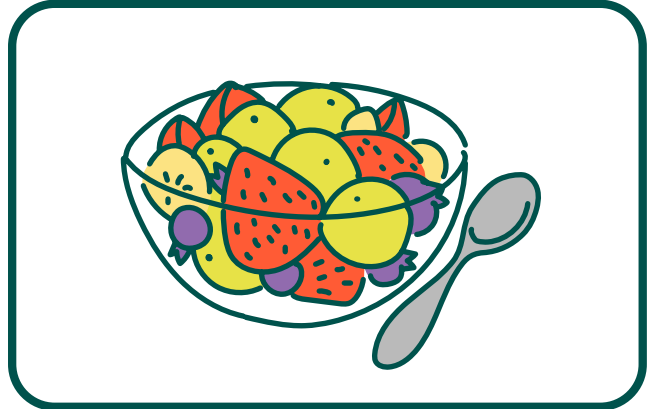
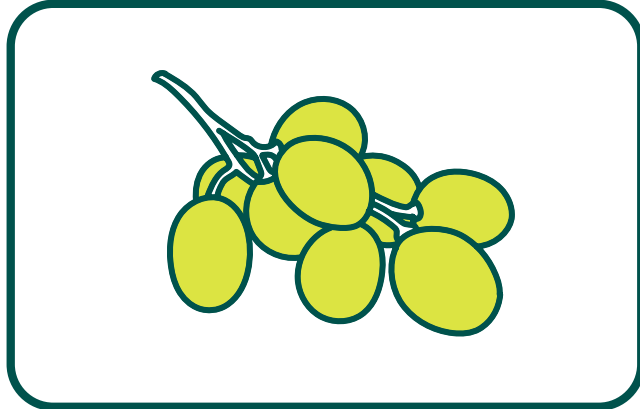
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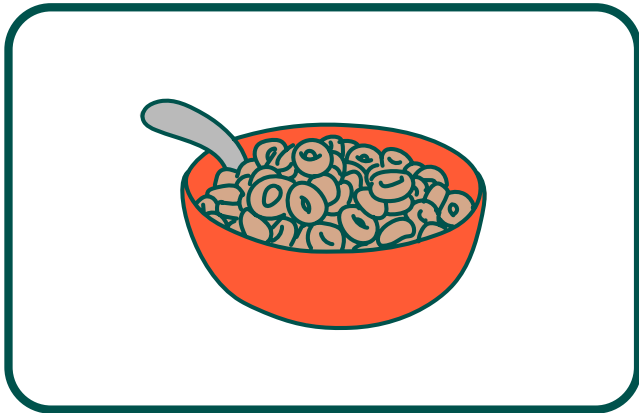
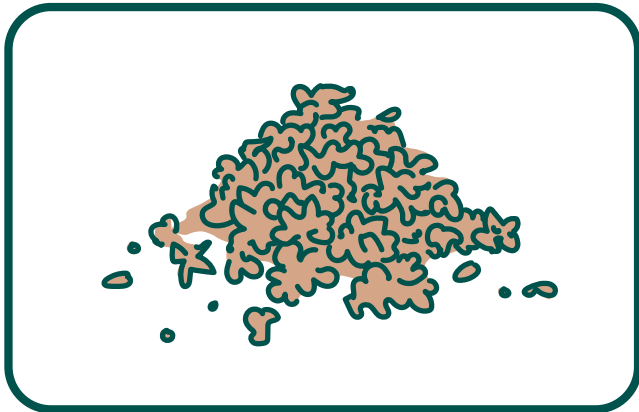
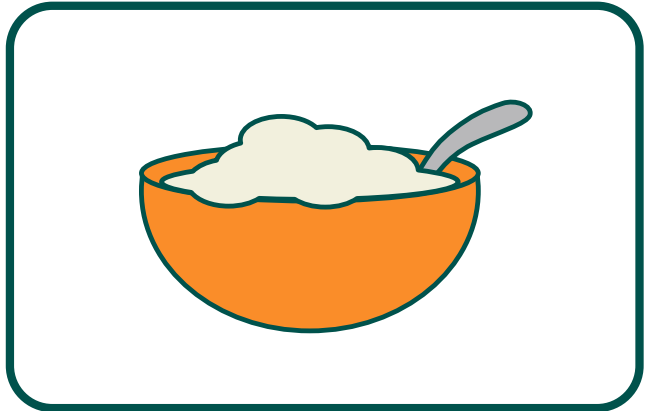
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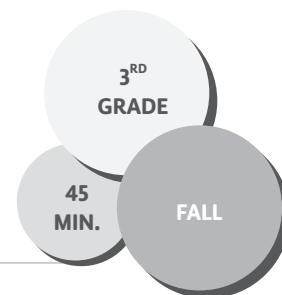


Processed Spectrum Sets



That's Life!

THEME: EXPLORING THE ECOLOGY OF FOOD



ESSENTIAL QUESTION

How do all living things grow and change over time?

LEARNING OBJECTIVES

- ✓ Students will be able to identify different stages of a plant's life cycle.
- ✓ Students will be able to draw the life cycle of a plant.

LESSON DESCRIPTION

In this lesson, students go on a life cycle scavenger hunt in the garden after exploring the different stages of a pumpkin's life and reading a book depicting this life cycle. In groups, they find samples of each stage of a plant's life cycle and draw the sequence.

MATERIALS

- One of the following children's books: *Pumpkin Circle* by George Levenson or *The Tiny Seed* by Eric Carle

For each group of 3–4 students:

- Pumpkin Life Cycle Cards (p. 270)
- Life Cycle Scavenger Hunt Worksheet (p. 271)
- Clipboard
- Pencils
- Tray, basket, or large yogurt container for collecting samples

PREPARATION

- › Scout around the garden, and identify plants that currently display several different life cycle stages.
- › Photocopy and cut out Pumpkin Life Cycle Cards.
- › Photocopy Life Cycle Scavenger Hunt Worksheet.

ACTION STEPS

1. Engage: In the garden, gather students in a circle, and ask them to turn and talk to a neighbor about what they remember doing when they were a baby. Then ask, *What can you do now that you couldn't do when you were a baby? What things will you be able to do when you get even older?* Explain that just like humans, plants grow and change over time and are able to do different things at different stages of their lives. **(5 min.)**

2. Sorting Pumpkin Life Cycle: Pass out the Pumpkin Life Cycle Cards to groups of students, and ask them to put the cards in order. Circulate through the room, observing the order and asking questions to check for understanding. **(5 min.)**

3. Reading: Say, *We're going to read a book about the life cycle of a plant to see if we put the pictures in the right order.* Read *Pumpkin*

Circle, pausing throughout and encouraging students to rearrange the cards based on the information they learn from the book. **(10 min.)**

4. Scavenger Hunt: Say, *You'll now go on a scavenger hunt throughout the garden and find an example of a plant species at each stage of its life.* Explain that they'll need to use two hands to pick the example, and remind them that they shouldn't pick something if there aren't more than ten still growing in the garden. Tell students the signal you'll use to gather them back to you and then pass out the Life Cycle Scavenger Hunt worksheet on clipboards, and pass out the containers for collecting samples. **(10 min.)**

5. Drawing: Gather students back together, and have them lay out the samples they collected in the order of the plant's life cycle, just like they did with the pumpkin cards. Have them work with their group to draw the different samples on their Life Cycle Scavenger Hunt Worksheet. **(10 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *What plant did you find?*
- *Was it challenging to find your samples at each life cycle stage? What clues did you look for?*
- *Why does the life cycle begin and end with seeds?*
- *How are plants' and animals' life cycles similar?*

ADAPTATIONS

Decomposition Extension: If you have a fruiting plant from the summer, such as a pumpkin or tomato, allow it to stay in the garden throughout the fall and winter, and have your class periodically check on it, keeping a log of their observations.

Seed-Saving Extension: Grow some plants out to seed, such as by letting a carrot, kale, or broccoli plant flower. Then have students collect all the seeds from the fall garden, putting them in separate envelopes and labeling them to take them home to plant next season.

Health Connection: Have students draw pictures of themselves at different stages in their own life cycles (i.e., as a baby, as a kindergartner, etc.). Discuss how eating well has helped them grow and can continue to help them grow over time.

ACADEMIC CONNECTIONS

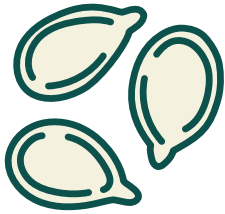
Next Generation Science Standards, Life Science Disciplinary Core Idea

NGSS.LS1.B Growth and Development of Organisms

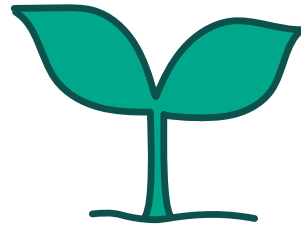
Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles.



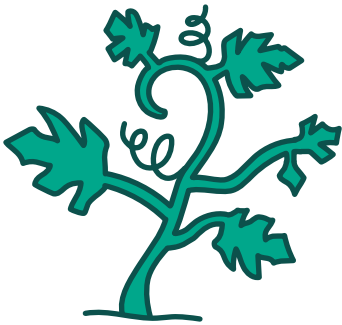
Pumpkin Life Cycle Cards



seeds



sprout



vines



flower



green baby
pumpkin

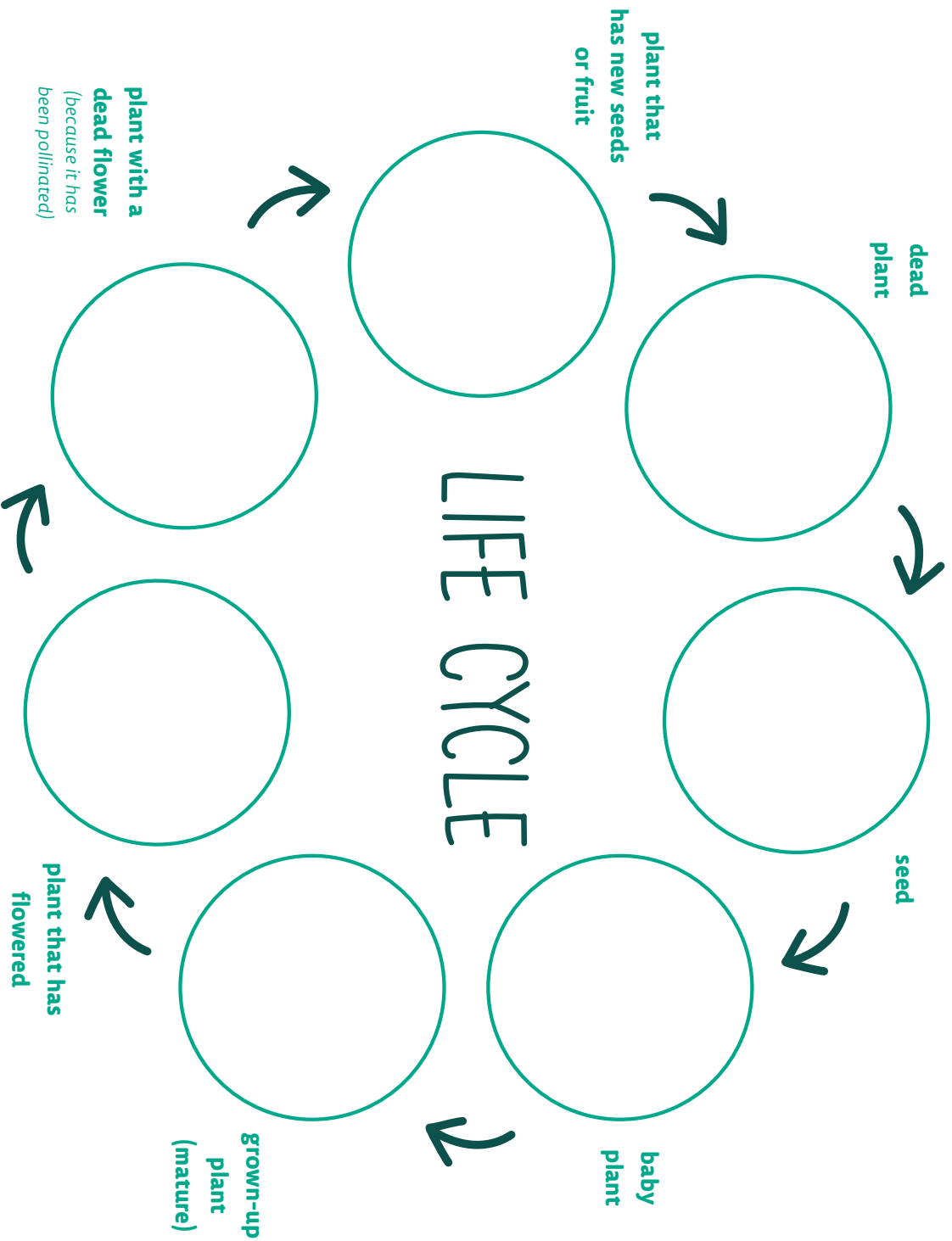


adult
pumpkin

Name: _____ Date: _____

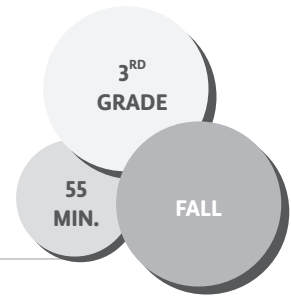
Life Cycle Scavenger Hunt Worksheet

Directions: In the circles below, draw a picture of your plant at each stage of its life cycle.



Worm Bin Wonders

THEME: GROWING AND ACCESSING HEALTHY FOOD



ESSENTIAL QUESTION

How do decomposers play an important role in growing food?

LEARNING OBJECTIVES

- ✓ Students will be able to identify parts of the worm anatomy.
- ✓ Students will be able to construct a worm bin.

LESSON DESCRIPTION

In this lesson, students learn about the decomposition of food waste by observing worms, identifying parts of their anatomy, and working collaboratively to build a worm bin.

MATERIALS

- 10-gallon opaque plastic storage bin
- Old newspaper
- Spray bottle filled with water
- 1 pound of Red Wiggler worms (if you have a friend with a worm bin, ask for some starter worms. If not, you can often purchase Red Wigglers in garden centers or even buy them online.)
- Quart container of garden soil
- Food scraps
- Cordless power drill with drill bit
- Paper towel for each student
- Permanent marker
- Worm Anatomy Poster (p. 276)
- Worm Body Part Cards (p. 275)
- Chart paper (optional)
- Magnifying glasses (optional)
- Coffee stirrers for moving worms (optional)

PREPARATION

- › If you are new to worm composting, research how to build and maintain a worm bin prior to teaching this lesson.
- › Collect approximately one quart of raw fruit or vegetable food scraps, perhaps from lunch or snack.
- › Use a permanent marker to mark and space out dots to drill holes along your bin's lid and the top third of the sides. Make sure there are enough dots so that each student can drill one hole.
- › Dampen paper towels to hand out to groups observing worms.
- › Draw a KWL chart on the board or chart paper (see example).
- › Photocopy or display Worm Anatomy Poster.

WHAT WE . . .

Know	Want to Know	Learned
------	--------------	---------

ACTION STEPS

1. Connecting to Prior Knowledge: Ask, *What do you typically do with food scraps?* Discuss whether students throw them in the trash, or whether they use compost bins. Ask, *Do you*

know that worms are excellent at recycling? See if students can explain how. Ask students to share with a partner what they know and what they want to know about worms. Display a KWL chart on the board, and as students share with the class, fill in the “Know” and “Want to know” columns of the chart, taking the opportunity to dispel any myths and/or flag any questions that arise for later research. **(5 min.)**

2. Explain Worm Bin Setup: Explain that today you’ll be building a worm bin that the class can use to process its food waste into excellent compost for the garden. Show the class the materials you’ll use for creating the worm habitat. Explain, *Shredded newspaper is the worms’ bedding, but they eat it too! We use the spray bottle to keep the newspaper nice and moist, like a wrung-out sponge. They can’t have it too wet or too dry because worms breathe through their skin and can actually drown! We add soil from the garden because it helps their digestion. We’ll also add food scraps, making sure that we bury it under the bedding so that we don’t also attract fruit flies and other pests. Worms aren’t crazy about food like onions and citrus. Do you know that worms can eat half their weight in food in a day?* **(5 min.)**

3. Explain Worm Observation: Explain that you’re going to pass out worms for students to observe at their tables, while other students begin work on the worm bin. Then groups will switch tasks. Ask, *How should we treat the worms?* Discuss being gentle. Say, *Let’s remember to be observers. So we’re mostly using our eyes to observe different parts of the worms. See how many body parts you can recognize.* Pass out a small handful of worms on dampened paper towels to half your students to observe.

Give students a purpose while they are observing the worms, such as generating a list of new questions they have for the KWL chart. **(5 min.)**

4. Setting Up Worm Bin: While half your students are observing worms, have the other half finely shredding newspaper and call them up one at a time to drill a hole into the bin (with help from an adult!), add their shredded newspaper, and spray with water. Be sure that each student only sprays a couple times. Remind students that we don’t want our worms to drown! **(15 min.)**

5. Finishing Worm Bin: Once all groups have both observed worms and helped establish the worm bin, have one student add the worms beneath the bedding, another student sprinkle the container of soil, and another bury the food scraps under the bedding. Have all students wash their hands, clean the workspace, and return to their seats. **(5 min.)**

6. Worm Anatomy Challenge: Show students a diagram of a worm, and ask them to share body parts they noticed. Then explain that there are still other body parts inside that we can’t see. Shuffle the Worm Body Part Cards, and hand them out to students. Challenge students to get into the order of the body parts of the worm (head at one end, then crop, gizzard, intestine, and anus at the other end). Now use this model to explain how worm digestion works: *Soil and organic matter, like decaying plants and food scraps, are ingested by the worm and get broken down with help from the grit in the gizzard. They travel through the intestines and are excreted as rich, beautiful compost full of good nutrients.* When students are in the correct order with the cards, have them wiggle together as one worm! **(10 min.)**

7. Reviewing Responsibilities: Explain to students that they'll be responsible for keeping their worms healthy, happy, and fed each week. You may want to appoint a Worm Lifeguard who rotates each week. Say, *You'll want to check your worms' bedding and spray water if it's too dry, or add more newspaper if it's too wet. Start by feeding them once a week, but be sure to observe how much they've eaten since you last fed them, and adjust the amount accordingly. (5 min.)*

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *What's one new thing you learned about worms today?*
- *How will you be taking care of your worms each week?*
- *What do you think we will see when we observe the worm bin in one week?*
- *What worked well in making our worm bin as a class? How could we have improved the experience?*

ADAPTATIONS

Extensions: Have students create a poster or brochure of how to care for the worm bin. Students can also keep a weekly log in which they take notes on what they observe. Try also having a rotating chores chart, so students are taking turns feeding, adding bedding, etc.

ACADEMIC CONNECTIONS

Next Generation Science Standards, Life Science Disciplinary Core Idea

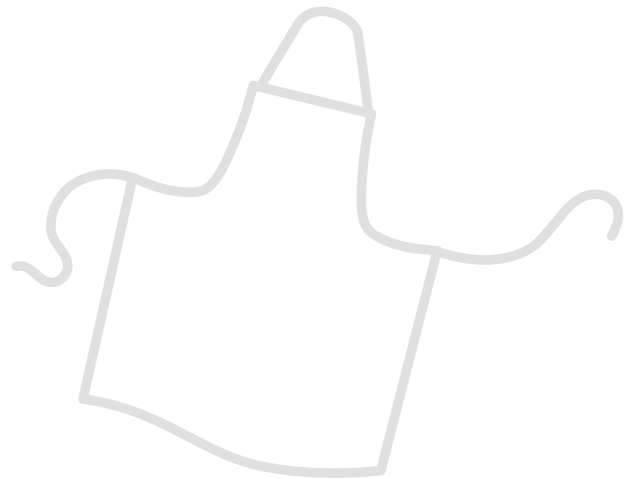
NGSS LS.4.D

Populations live in a variety of habitats, and change in those habitats affects the organisms living there.

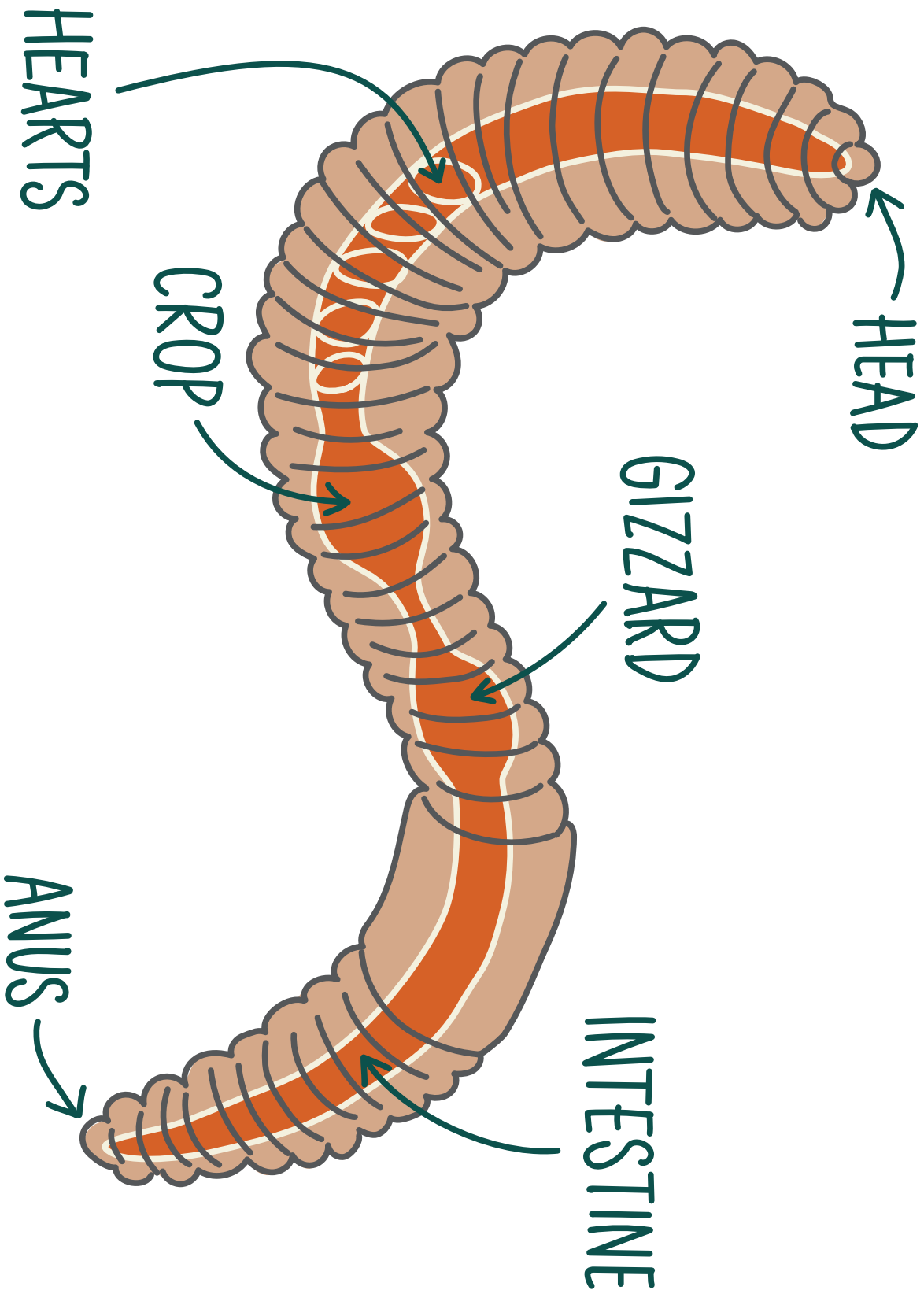
English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.SL.3.1

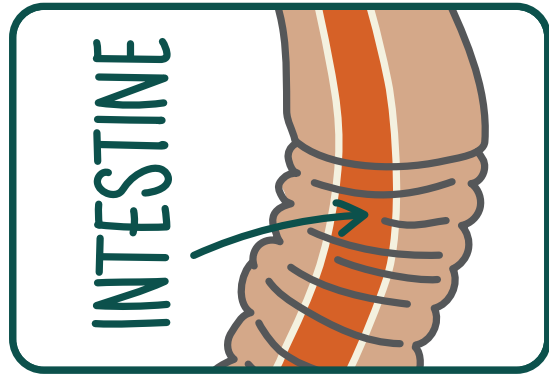
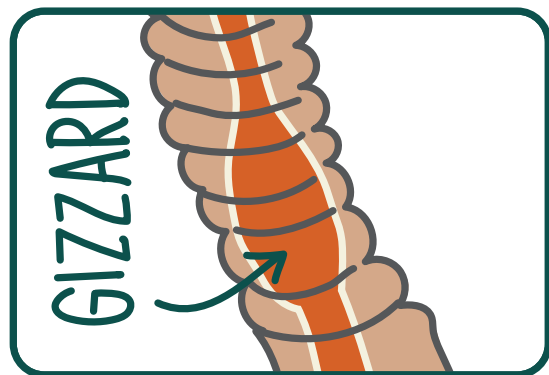
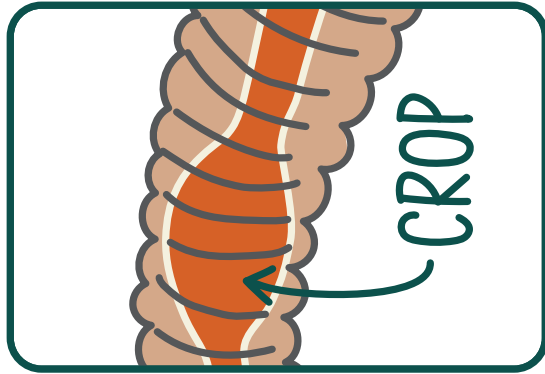
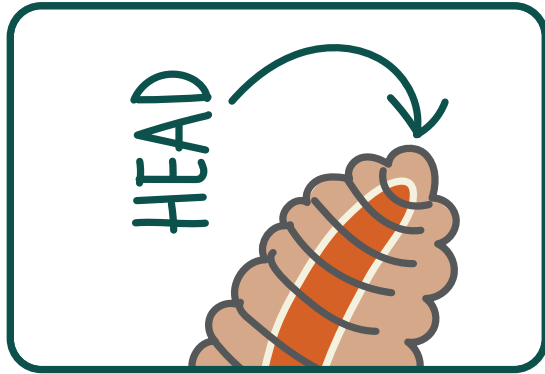
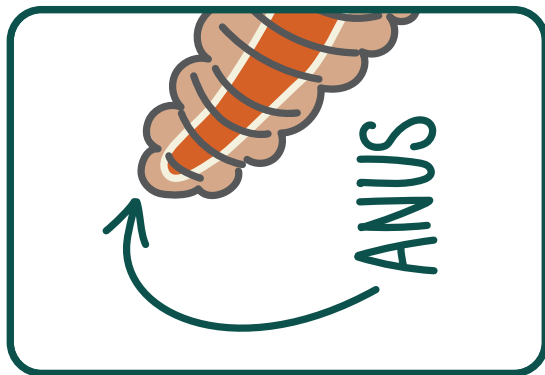
Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly.



Worm Body Part Cards



Worm Anatomy Poster

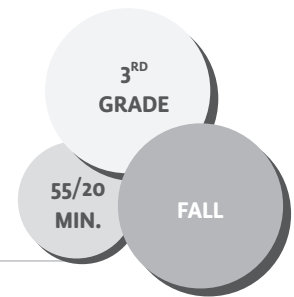


Quick, Pickle That!

THEME: PREPARING HEALTHY FOOD

55 min. (Day One)

20 min. (Day Two)



ESSENTIAL QUESTION

How can we preserve fresh fruits and vegetables?

LEARNING OBJECTIVE

✓ Students will be able to collaborate to make quick pickles.

LESSON DESCRIPTION

In this lesson, students explore the role of preservation in preparing food. In teams, they make customized quick pickles.

MATERIALS

- Jar of store-bought sliced pickles
- Toothpicks
- 2–3 different ingredients from each column in the chart
- Pitcher of prepared brine
- Liquid measuring cup
- Wide-mouth funnel
- Masking or painter's tape
- Permanent marker
- Materials for cleanup
- Blank Recipe Cards for each student (p. 280)

Tray with the following for each group of 4–6 students:

- Half-pint jar with lid
- Several cutting mats
- Several knives
- Wide-mouthed funnel
- Bowl of produce you're pickling—from the chart (You may opt to have different groups prepare different vegetables, or keep it simple with one type of vegetable and allow for variety through the use of herbs and spices.)
- Small bowl for gathering herbs and spices
- Container for compost

PREPARATION

- › Place sliced pickles on a plate, and skewer each with a toothpick.
- › Before class, use the Quick Pickling Brine Ratio to make a brine for the class to use. Allow the brine to cool before handling it with students.
- › Wash the produce.
- › Prepare a small tray of samples of the herbs and spices students will have to choose from.
- › Set up a station at the front of the room with measuring spoons and the various herbs and spices available to students.
- › Photocopy and cut blank recipe cards for students.
- › Check with school staff, and locate a refrigerator where you can store your pickle jars until you meet with your group the following week for Day Two of the lesson (tasting).

ACTION STEPS

1. Engage: Teach students the tongue twister, “Peter Piper picked a peck of pickled peppers.” Ask students whether they’ve ever eaten a pickle. Ask, *When you imagine a typical green pickle, do you know what plant that comes from?* Discuss cucumbers, but also explain that so many other fruits and vegetables can make delicious pickles, like Peter Piper’s pickled peppers. **(5 min.)**

Quick Pickling Brine Ratio*

- 1 cup vinegar
- 1 cup water
- 1 Tbsp salt

*Adjust the amounts assuming each half-pint jar will need approximately a ½ cup of brine. Combine ingredients in a saucepan over high heat and bring to a boil. Stir the liquid so the salt dissolves.

POSSIBLE PICKLE INGREDIENTS

Produce	Vinegar (1-to-1 ratio with water)	Herbs and Seasoning
• Cucumbers	• Apple cider vinegar	• Dill flower heads and seeds
• Zucchini	• White vinegar	• Rosemary
• Summer squash	• Rice vinegar	• Thyme
• Green beans		• Honey
• Sweet peppers		• Coriander seeds
• Carrots		• Turmeric
• Strawberries		• Paprika
• Rhubarb		• Garlic cloves
• Radishes		
• Turnips		

2. Pickle Tasting: Give each student a pickle slice on a toothpick, and have him or her taste it. Ask students to describe how pickles taste and if they know what ingredients give pickles their taste. Explain, *For as long as humans have been eating food, they've found ways to preserve. Preserving means to make something last longer. For example, berries only grow for a few months in the summer, so people make jam as a way to enjoy the flavor all year long. Pickles are the same. We add vinegar or salt to foods as a way to make them last longer. Pickling foods first began as another way to preserve the summer harvest.* Introduce the vegetable you'll be using in class. **(5 min.)**

3. Explain the Activity: Tell students that today they're going to make pickles. Explain that they'll get to decide in groups what ingredients to use,

and then they'll taste all the different pickles during the next class. Pass a sample of the various herbs and spices around the circle for students to smell, naming each one and having students repeat the name. Explain that in groups they'll decide on their flavors, chop their vegetables, and add all the ingredients to their jar. Explain that you'll then come around to help them fill their jar almost to the top with brine. Show them the brining liquid, explaining that it's equal parts water and vinegar with some dissolved salt. **(5 min.)**

4. Wash Hands Break! Remind students about the importance of cleanliness while cooking and preserving food. **(5 min.)**

5. Knife Skills Demonstration (5–10 min.)

6. Deciding on Flavors: Split the class into groups of 4–6, and have them discuss and determine which seasoning they'd like to add to their pickles. **(5 min.)**

7. Making Pickles: Pass out trays with supplies to each group. Supervise students while they're cutting vegetables. While teams are chopping, have one team member from each group come up and shop for the flavoring ingredients. Emphasize that they should take no more than 2 teaspoons of spices and no more than 1 tablespoon of fresh herbs. Once students have packed vegetables, herbs, and spices into their jar, move through the room, pouring the brine over the contents, leaving ¼ inch of room at the top of the jar. Have students seal the jars, and use a permanent marker to write their team name and the date on masking tape to label their jar. **(10 min.)**

8. Writing the Recipe: Have students clean up. Pass out recipe cards. Have them write a list of the

ingredients they used. Next, as a class, review the directions for making quick pickles. Explain, *These are also called refrigerator pickles because they must be kept in the fridge, which is where I'll keep them until I see you next!* (10 min.)

REFLECTION

Have students discuss the following questions in small groups, then share with the class: (5 min.)

- How do you pickle something?
- Why do people pickle foods?
- What makes pickles a healthy food?
- How did your group decide what to put in your pickle jar?

ADAPTATIONS

Follow-Up: Next class, have each group share what type of pickles they made. Then have a smorgasbord of pickles to try. Students can use toothpicks to test pickles from each jar. You may want to bring plain crackers as a palate cleanser between pickle tastings. It should take about one week for the pickles to ferment. Remember to eat the pickles within two to three weeks after making them. Also, children who are at high risk for food-borne illnesses (those with compromised immune systems) should eat refrigerator pickles within the fresh food guideline time frame of three days.

Garden Setting: Have teams of students harvest the summer fruits and herbs from the garden to make your quick pickles.

ACADEMIC CONNECTIONS

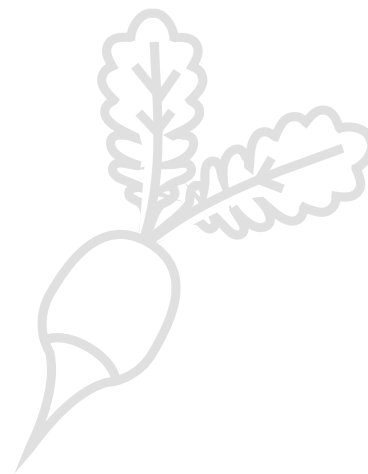
English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.L.3.5

Demonstrate understanding of figurative language, word relationships and nuances in word meanings.

CCSS.ELA-LITERACY.L.3.5.B

Identify real-life connections between words and their use (e.g., describe people who are *friendly* or *helpful*).



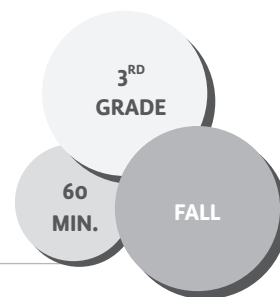
Recipe Cards

INGREDIENTS	STEPS

INGREDIENTS	STEPS

Celebrating the Autumn Harvest

THEME: GROWING AND ACCESSING HEALTHY FOOD



ESSENTIAL QUESTION

Why is it important to give thanks when harvesting from the garden?

LEARNING OBJECTIVES

- ✓ Students will be able to explain why being respectful in the garden is important.
- ✓ Students will be able to thoughtfully harvest from the garden.

LESSON DESCRIPTION

In this lesson, students will appreciate the abundance of an autumn garden, through observation and a scavenger hunt. They will consider the “honorable harvest,” how to respectfully and thoughtfully harvest from plants, and they will put these principles into practice by harvesting and preparing a simple tasting of ripe fruits and vegetables from the garden.

MATERIALS

- How We Harvest poster
- Harvest Scavenger Hunt Worksheet for each pair of students
- Clipboards and pencils
- Large bowls or colanders for students to harvest into
- Supplies for washing vegetables
 - Hose
 - Bus tubs
 - Clean, dry towels

- A few full watering cans
- Snips for deadheading, if available
- Mulch or finished compost, if available
- Wooden skewers, if using
- Plate or paper towel for each student
- Easy Herb Dip Ingredients, if using (see box below)
- Bowls for dip, if using

PREPARATION

- › Read local resources related to harvest or one or more of the following resources describing the “Honorable Harvest”:
 - › The chapter, “The Honorable Harvest,” from Robin Kimmerer’s *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge, and the Teachings of Plants* (2013)
 - › The article, “The ‘Honorable Harvest’: Lessons From an Indigenous Tradition of Giving Thanks” in *YES! Magazine* online
- › Explore local indigenous and native harvest traditions by talking with elders, partners, and individuals with local harvest knowledge in the community. If possible, ask local individuals to share these traditions with students. If not, with permission, integrate those traditions into your harvest lesson.
- › Familiarize yourself with the local harvesting seasons because these are not the same in every place.

- › Create a large poster of the How We Harvest: Thoughtful Harvesting Practices to share with students.
- › Determine what kind of tasting you'll have based on what you have to harvest (e.g., make wraps such as in the lesson Plant Part Wraps, pass out wooden skewers for students to make their own veggie skewers, or prepare the Easy Herb Dip).
- › Determine which beds you'll harvest from and how you'll arrange to have students all harvesting at the same time. Ideally, you'd have a couple adjacent beds students can harvest from and/or an adult volunteer to help students at another bed.
- › Set up a washing station close to a food-grade hose, where students can wash produce under running water.
- › Set up supplies for students to use to "give back to plants," such as a few full watering cans, some snips for deadheading, some mulch, or some finished compost.
- › Prepare the dip, if using.

Easy Herb Dip Ingredients

- 1 tub Greek yogurt*
- Handful of finely chopped herbs (such as parsley, dill, mint, and basil)
- Lemon juice
- 1–2 Garlic cloves, minced
- Salt and pepper to taste

*For dairy-free students, consider dairy-free alternatives such as coconut, almond, or cashew yogurt.

ACTION STEPS

1. Engage: Gather students in a circle and say, *The word "abundance" means a lot of or*

an overflowing amount of something. Ask, Staying in your spot, turn your head looking all around the garden. Where do you see abundance? Have students share their observations, and then explain *how the fall is a special time of year when all the hard work preparing the soil, planting seeds, watering, and weeding comes to fruition—it's time to pick and gather all the ripe crops we've tended all season long.* Discuss what "harvest" means and if there is a local word for this practice. You might even share how, in Old English, the word for the season between summer and winter was called "harvest." **(5 min.)**

2. Scavenger Hunt: Pass out a clipboard and Harvest Scavenger Hunt Worksheet to each pair of students. Let students know they'll be looking for things that are ready to harvest, but they won't be harvesting anything yet. You'll do that together later in the lesson! Remind the class of expectations in the garden and your callback strategy for when it's time to circle up again. **(10 min.)**

3. The Honorable Harvest: Call students back to the circle, and ask pairs to share one example of abundance they found in the garden. Invite local elders, partners, and individuals with local harvest knowledge in the community to participate in or lead this circle. Say, *Nature is giving us gifts of food to eat and save up for wintertime—gifts of beautiful flowers to make us smile and gifts of seeds to collect for planting next season. We want to honor these gifts by being respectful and thoughtful with them.* Display the How We Harvest poster of thoughtful harvesting practices for students to see. Go over each practice, and ask students why that practice is important and what that

might look like. Share the origin of this tradition and local harvest traditions, if possible. Explain to students that they can verbally ask plants for permission, such as saying, “May I harvest your fruit?” But also explain to students how to test for ripeness. Say, *By giving a gentle tug on a fruit, we can see if it’s ripe and ready. If it doesn’t want to come off easily, that’s the plant’s way of saying it’s not ready to be harvested yet.* Ask students for ideas of how to give thanks and give back to the plant they’re harvesting from. Ideas might include saying thank you and breathing some carbon dioxide onto the plant, watering it, removing dead growth, applying mulch, top dressing with fresh compost, or weeding around its roots. **(10 min.)**

4. Harvesting and Preparing: Bring students to the beds they’ll be harvesting from, and tell students about the plant or plants they’ll be harvesting. Model the proper technique for harvesting that particular plant, and then allow students to harvest. Encourage each student to ask for permission and to harvest carefully. Have small groups of students take turns washing produce. **(10 min.)**

5. Giving Back to the Plants: Discuss with students what these plants need to grow and thrive (sun, nutrients from soil, water, and air), and then give back to the plant in their own way, such as by sprinkling plants with finished compost, weeding around them, speaking to them, or watering them. **(10 min.)**

6. Tasting: Gather students back together to try the fruit or vegetables you’ve harvested. You might invite students to express words of gratitude before the tasting. **(10 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *How do we know if a plant is ready to be harvested?*
- *What examples of abundance in our garden are most exciting to you?*
- *What are ways we can give thanks to the plants that produce so much good food for us?*
- *Sometimes abundance isn’t something we can see or touch. What are other examples of abundance in your life?*
- *Ask yourself: How was I respectful toward others and the plants in the garden today?*
- *How do you feel when you treat plants with care and respect?*

ADAPTATIONS

Music: Sing “Dirt Made My Lunch” by the Banana Slug String Band, a song in which you give thanks to soil for helping grow the food you eat.

Gifting: If you have a bumper crop (a crop that has yielded an unusual abundance), consider ways of sharing the harvest with other school community members, such as setting up a table outside the classroom, sharing with parents at pickup, or donating to a local food pantry.

ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.L.3.5.B

Identify real-life connections between words and their use (e.g., describe people who are *friendly* or *helpful*).

NOTE: Connect to state social studies standards if possible.

How We Harvest Poster

How We Harvest Thoughtful Harvesting Practices

- Ask permission of the ones whose lives you seek.
Abide by the answer.
- Never take the first. Never take the last.
- Harvest in a way that minimizes harm.
- Take only what you need and leave some for others.
- Use everything that you take.
- Take only that which is given to you.
- Share it, as the Earth has shared with you.
- Be grateful.
- Reciprocate the gift.
- Sustain the ones who sustain you,
and the Earth will last forever.



Excerpted from Robin Kimmerer, "The Honorable Harvest: Lessons From an Indigenous Tradition of Giving Thanks" (2015)

Name: _____ Date: _____

Harvest Scavenger Hunt

Directions: Find as many examples of abundance in our garden as you can!
Don't harvest anything yet! We'll do that together soon!

- Find the plant with the **biggest** fruit growing on it.
 - Find the plant with the **most** edible fruits growing on it.
 - Find a fruit that is ripe and ready to harvest.
 - Find a plant with seeds that are ready to be harvested.
 - Find a plant with leaves that are ready to be harvested.
 - Find a plant with a root that is ready to be harvested.
 - Find a plant to represent every color of the rainbow!
- | | | |
|--------------------------------|---------------------------------|---------------------------------|
| <input type="checkbox"/> Red | <input type="checkbox"/> Orange | <input type="checkbox"/> Yellow |
| <input type="checkbox"/> Green | <input type="checkbox"/> Blue | <input type="checkbox"/> Purple |
| <input type="checkbox"/> Pink | <input type="checkbox"/> White | <input type="checkbox"/> Brown |

Name: _____ Date: _____

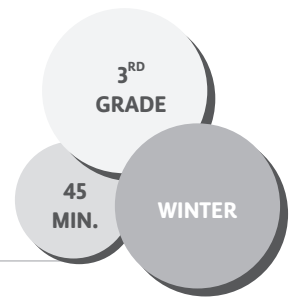
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| <input type="checkbox"/> Pink | <input type="checkbox"/> White | <input type="checkbox"/> Brown |

Tortilla Time!

THEME: MAKING HEALTHY FOOD CHOICES



ESSENTIAL QUESTION

How do the foods we eat get from the plant to our plate?

LEARNING OBJECTIVES

- ✓ Students will be able to distinguish whole foods and processed foods.
- ✓ Students will be able to prepare homemade tortillas.

LESSON DESCRIPTION

In this lesson, students learn to distinguish between whole and processed foods by making corn tortillas from masa harina, and they learn about the cultural tradition of tortilla making through listening to a read-aloud.

MATERIALS

- Dried corn on the cob and/or a jar of corn kernels
- Empty bag of corn chips
- Tortilla ingredients
- Mixing bowl
- Induction burner
- Extension cord
- Nonstick pan
- Cutting mats (2–3 for each group of students)
- Plate for each student
- Materials for cleanup
- *The First Tortilla* by Rudolfo Anaya (YouTube read-aloud)
- 4–6 rolling pins (optional)
- Grinder (optional)
- Mortar and pestle, with newspaper underneath (optional)
- Tortilla press (optional)

Tortilla Ingredients

(for 30 6-inch tortillas)

- 3 cups masa harina
- 1/3 tsp kosher salt
- 2 1/4 cup hot water

PREPARATION

- › Find out if you have any students whose family members know how to make tortillas and, if so, invite them to teach the students how to press and cook tortillas.
- › Recruit a second adult, if possible, to cook the tortillas while you guide the students in an activity while they wait.
- › If you haven't made tortillas before, practice on your own to become familiar with the process, and address any challenges ahead of time.
- › Find a read aloud on YouTube of Rudolfo Anaya's *The First Tortilla* to show to students.
- › Set up a station with your induction burner and pan. If you have a mortar and pestle or grinder, set up a station where students can take turns independently grinding corn with these tools.
- › Follow the directions on your masa harina package to prepare the tortilla dough beforehand.
- › Divide the dough evenly for groups of 4–6 students to make one tortilla each. (A ball the size of a ping-pong ball will make approximately one 6-inch tortilla.)

ACTION STEPS

1. Engage: Explain to students that today you'll be talking about whole versus processed foods and getting to know corn a little better. Say, *Every day we typically eat a mix of some whole and some processed foods.* Show students the corn on the cob and the empty corn chip bag. Say, *Think in your heads which one of these is whole and which one of these is processed.* Then take a vote. Reveal the answers. **(5 min.)**

2. Defining Whole Versus Processed: Ask students to turn and talk to a partner to come up with a definition of what a whole food is versus what a processed food is. Share answers, and come up with definitions as a class. Ask, *Do you think the corn chips have been processed just a little bit or a lot?* Have students show you with their hands the extent to which they think the corn chips have been processed. Explain that the more steps a food undergoes and the more additional ingredients added, the more processed it is. **(5 min.)**

3. Explain the Activity: Tell students that today they're going to process corn to make a new food themselves: tortillas! Explain that Mexico and other countries in Central America have been making tortillas from corn for centuries. Show students the jar of corn kernels and the jar of masa harina. Ask, *How do you think the corn went from this to this?* Discuss grinding the corn. If you have a grinder or mortar and pestle, show these tools, and tell students they'll have the opportunity to use them soon. Then show students the prepared tortilla dough. Ask, *How do you think I processed the masa harina to make this dough?* Tell students about adding water, mixing, and kneading the dough. **(5 min.)**

4. Model: Model for students how to make a tortilla. Pinch off a ping-pong sized amount, and roll into a ball. If you don't have a tortilla press or rolling pins, show students how to press the ball with the palm of their hands until it's about six inches in diameter. Explain that once they're finished making their tortilla, they'll bring it up to you on their plate, where you'll cook it for them. **(5 min.)**

5. Making Tortillas: Pass out cutting mats, and provide groups of students with tortilla dough. If you have grinding tools, this is the time to invite students to practice using them. Heat up your nonstick pan as students begin pressing the dough. Cook the tortillas for one or two minutes on each side. Be sure students keep a safe distance from the burner as you cook their tortillas. You may want to allow students to eat their tortilla when they return to their seat while it's still warm or when everyone at their table has one. **(15 min.)**

6. Enjoy! Consider playing a read-aloud of *The First Tortilla* by Rudolfo Anaya to share more about the tradition of tortilla making and to keep students engaged once they've made their tortilla. **(5 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *How many steps did it take to go from corn on the cob to our tortillas?*
- *Do you think some processed foods are healthy choices? Do you think all processed foods are healthy choices?*
- *What are some words you would use to*

describe our tortillas' smell? Taste? Texture?

- What tips or tricks did we find for creating our tortillas?

ADAPTATIONS

Tasting Extension: Conduct a taste test comparing homemade tortillas with store-bought ones.

ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards

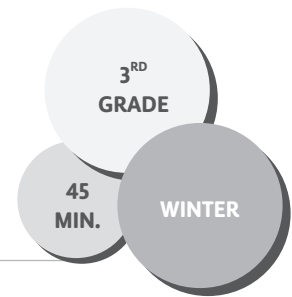
CCSS.ELA-LITERACY.SL.3.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 3 topics and texts*, building on others' ideas and expressing their own clearly.



Let's Jam!

THEME: EXPLORING THE ECOLOGY OF FOOD



ESSENTIAL QUESTION

Where does our food come from?

LEARNING OBJECTIVES

- ✓ Students will be able to explain the steps and people involved in processing food.
- ✓ Students will be able to make a simple jam.

LESSON DESCRIPTION

In this lesson, students consider the steps in the food system with each student taking on an important role in the processing of strawberry jam.

MATERIALS

- Role Cards (1 per student)
- Bowl for role cards
- Chart paper or class board
- Large bowl for rinsed berries
- Large mixing bowl for sliced berries
- Measuring cups
- Long-handled spoon
- Ladle
- Tape
- Permanent marker
- Small tasting cups
- Jam ingredients (see recipe below)
- 5 cutting knives
- 5 cutting mats
- Tray
- Crackers or toast to eat jam with
- Our Food System Worksheet (p. 292) for each student
- Colored pencils

PREPARATION

- › Create 1 Role Card for each student.
Depending on the class size, you may need to combine a few roles, or give the same role to several students. Roles such as Ingredients Sourcer and Mixer could be combined, while roles such as Slicer and Supermarket Seller could work for several students to have.
- › Photocopy the Our Food System Worksheet for each student
- › Set up three stations in the room where students can enact each step: the farm, the factory, and the supermarket. Put appropriate supplies at each station.
- › Optional: Gather props for students to use to distinguish and add to their roles (e.g., create a steering wheel out of cardboard for the truck driver, provide hair nets for the factory workers, etc.)

*Chia Strawberry Raw Jam**

- 4 cups strawberries (frozen if not in season)
- 2–4 Tbsp lemon juice, to taste
- 2–4 Tbsp honey, agave, maple syrup, or sugar, to taste
- 4 Tbsp chia seeds, plus more if needed

*NOTE: This lesson could work with any type of jam that makes sense in your region at this time of year (orange marmalade, cranberry, etc). This particular Chia Strawberry Raw Jam is a good option if you don't have access to a burner because it's prepared raw.

FOOD SYSTEM ROLES

FARM

- **Harvester**—Pick stems off berries
- **Washer**—Wash berries
- **Truck Driver**—Deliver berries

FACTORY

- **Slicer**—Slice berries into small pieces
- **Ingredients Sourcer**—Follow recipe and measure ingredients
- **Mixer**—Add ingredients and mix
- **Label Maker**—Create a label for each cup
- **Packager**—Pour strawberry jam into cups and affix label

SUPERMARKET

- **Truck Driver**—Transport cups to supermarket
- **Supermarket Seller**—Sell (pass out) cups to customers

ACTION STEPS

1. Engage: Gather students in a circle, and show them a pint of strawberries and strawberry jam. Ask, *What's the difference between these two things?* Discuss. Ask, *What steps would it take to get from one to the other?* On the board or chart paper, make a list of the steps students anticipate. **(5 min.)**

2. Assign Roles: Explain, *Today we're going to make strawberry jam. You'll each have a role to play in the "food system."* A "food system" is a series of people and activities that get food from a farm to our plates. Show students the "farm," the "factory," and the "supermarket" in the classroom. Pass out the Our Food System Worksheet. Explain that while some students are performing their roles, others will be illustrating the process. You might pay homage to farmers by having all students pretend to plant strawberry seeds as the first step of the process. Have students draw

role cards out of a bowl and then go to their respective stations. **(5 min.)**

3. Wash Hands Break! (5 min.)

4. Making Jam: While a few students at a time are fulfilling their role to help make the jam, have the remaining students illustrate each step on their worksheet. Have Harvesters pick stems off berries, have Washers rinse the berries, and have the Truck Driver deliver the berries to the factory station. At the factory, the Labelers can start creating and affixing labels to cups while the rest of the factory workers are making the jam. Have Ingredients Sourcers measure out other ingredients while Slicers slice berries and place them in a bowl they pass off to the Mixer. After the Mixer has incorporated all the ingredients, he or she should pass the bowl to the Packager who will pour a little into a tasting cup for each student. If you have the time, place the jam in the refrigerator to set for thirty minutes. Otherwise, expect it to be a bit runny. **(20 min.)**

5. Tasting: Have the Truck Driver transport the cups to the supermarket on a tray. Then have students form single file lines at the supermarket to buy jam from the Supermarket Sellers. Meanwhile, deliver crackers to students' desks. Once all students have jam, have them taste together, and ask students to describe the flavors and texture of their jam. Explain that most jam you buy at the store is cooked but that they made a raw jam that gets its texture from chia seeds. **(5 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- What are some differences between buying jam and making our own jam?
- What surprised you about the activity we did today taking strawberries from the farm to the supermarket?
- Why is each person important in the process of making the food we buy and eat?
- Ask yourself: How did I contribute to making this jam? Did I work well with my classmates?

ADAPTATIONS

Economics Extension: Have students consider the cost of each step by having a dollar symbol to represent the pay for each person involved in the process and tallying the dollar symbols. You can also discuss with students how much they would want to get paid for their role, and add those figures to get at the total cost. This extension could be a great conversation starter for engaging older grades in thinking about farm workers' rights and compensation.

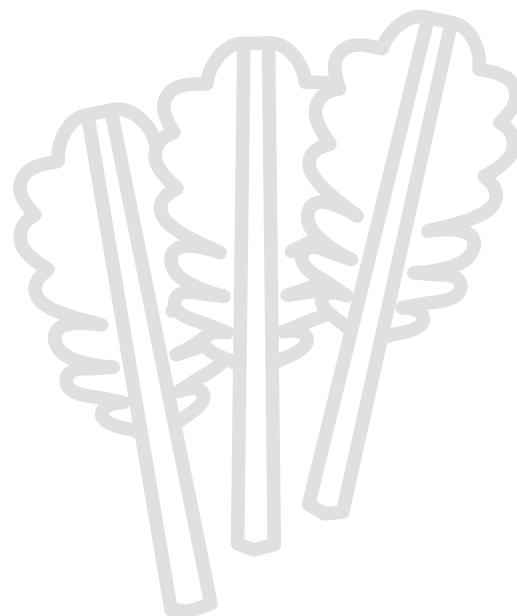
Literacy Extension: Read *How Did That Get in My Lunchbox?* by Chris Butterworth to reinforce and expand upon the concepts in this lesson.

ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.SL.3.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 3 topics and texts*, building on others' ideas and expressing their own clearly.

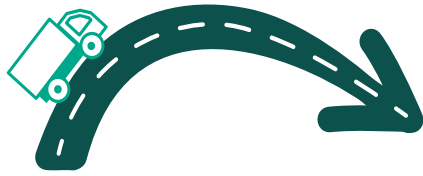


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Date: _____

Our Food Systems Worksheet

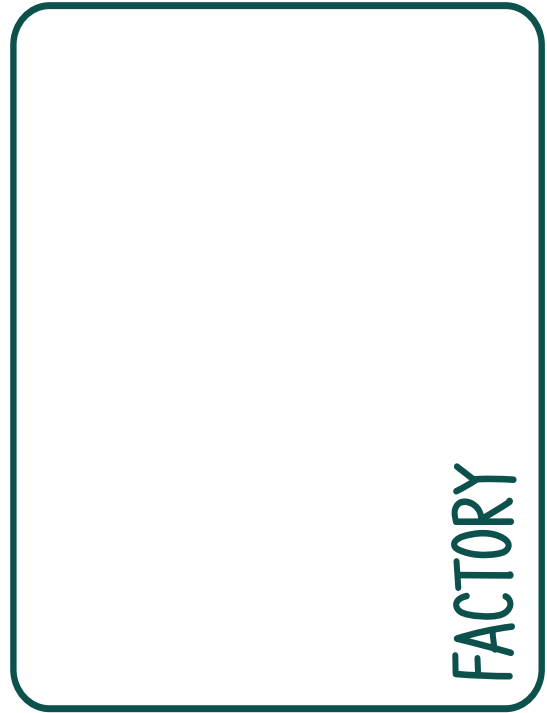
FARM



SUPERMARKET

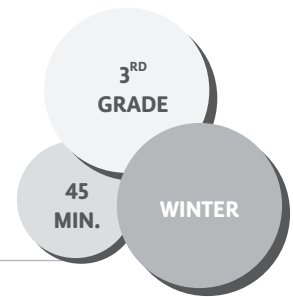


FACTORY



Exploring Our Worm Bin

THEME: GROWING AND ACCESSING HEALTHY FOOD



ESSENTIAL QUESTION

How can we help create a healthy, thriving ecosystem?

LEARNING OBJECTIVE

✓ Students will be able to identify and describe indicators of the health of their worm bin's ecosystem.

LESSON DESCRIPTION

This lesson is a follow-up to the third grade fall Worm Bin Wonders lesson. In this lesson, students observe changes that have occurred in the worm bin they established in the fall, diagram elements they can identify in the worm bin, and compare their knowledge of worms to information in a book about worms.

MATERIALS

- *Wiggling Worms at Work* by Wendy Pfeffer
- Established worm bin
- 1 copy of the class Worm Bin Chart (if students have been tracking chores using the extension adaptation from fall's Worm Bin Wonders lesson)
- Magnifying boxes (ideally one for each pair of students)
- Dampened paper towels to put worm castings on
- A separate, small bin of dampened paper towels for cleanup
- Paper and pencils
- Food scraps for the worm bin
- Chart paper and markers
- Gardening gloves (optional)
- Worm Bin Creatures Poster (p. 296)

PREPARATION

- › Check your worm bin just before the lesson to make sure your worms are doing well.
- › Photocopy Worm Bin Creatures Poster.
- › Write guiding questions on chart paper or the board:
 - › What changes have occurred since we set up our worm bin?
 - › What other living things are present, apart from our Red Wiggler worms?
 - › What worm behaviors do you observe?
 - › How do you think we should change the food or bedding to make the habitat better?

ACTION STEPS

1. Engage: Gather in a circle and ask students how caring for their worm bin has been. Ask, *How do we know that the worms are doing well? What should our noses, hands, and eyes look for?* You may need to remind students that we can think of the worm bin like the house in Goldilocks and the Three Bears. Say, *The worms don't want their environment to be too wet or too dry, but juuuust right.* Explain that today they're going to have a second chance to observe worms up close, but this time, they'll also be looking at part of the habitat they've created for them. **(5 min.)**

2. Explain Expectations: Display the guiding questions, and read each one aloud. Say, *As you're observing the worms, you'll be thinking about and discussing each of these questions with your partner. Then you'll draw a picture of everything you see in your pile of worm castings, and you'll try to label each part.* Students can refer to the Worm Bin Creatures handout. Emphasize handling the worms gently because the worms are our helpers in the garden. Also emphasize to students that their job is to be observant detectives, gathering clues by using their five senses. **(5 min.)**

3. Observing: Have students return to their desks, and give pairs a magnifying box, paper and pencil, a damp paper towel, and a small handful of castings from the worm bin that includes a couple worms. After eight to ten minutes, collect worms, have students wipe their hands with fresh, wet paper towels, and collect all the wet paper towels in one bin. **(10 min.)**

4. Debriefing: Come back together on the carpet with students' drawings. Go through the guiding questions, and have students share their drawings, naming all the different components and organisms they identified. Ask probing follow-up questions to their observations such as, *Hmm, a lot of you observed fruit flies. I wonder why our worm bin has fruit flies. Do you think there is something we can do differently? Or, Wow, a lot of you observed that our worm bin is sort of stinky. Why do you think? Or, What clues tell us we're feeding them too much, too little, or just right?* **(7 min.)**

5. Feeding the Worms: Add some food scraps to the worm bin, and cover with the used, wet paper towels. **(3 min.)**

6. Reading: Read *Wiggling Worms at Work*. Explain that whenever students hear something they already know about worms, they should make a wave gesture with their hand, like a worm wiggling, but when they hear new information, they should tap their heads with their hands (or you could teach them American Sign Language for "idea"). After reading, acknowledge and congratulate students for all the information they already knew about worms. **(10 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *What were you surprised to observe in our worm bin? What is one new thing you learned about worms today?*
- *What is the best habitat for our worms? Do we need to change any of the ways we've been caring for them?*

ADAPTATIONS

Physical Activity: Play Decomposer Tag at the school's field, blacktop, or gymnasium. Have one student wear an armband indicating that they're "Frost" or "Death," and have a couple other students wear a different-colored armband, indicating their roles as worms or decomposers. Have all other students be plants. If Death tags a plant, the plant is frozen until a decomposer tags it, representing the decomposition cycle. To show that without decomposers recycling plant matter there's no new life, try playing where Death is allowed to tag the decomposers.

ACADEMIC CONNECTIONS

Next Generation Science Standards, Life
Science Disciplinary Core Idea

NGSS 3.LS4.D

Populations live in a variety of habitats, and
change in those habitats affects the organisms
living there.

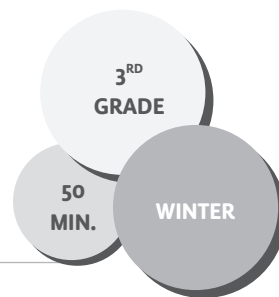


WORM BIN CREATURES



Root Fruit Slaw

THEME: PREPARING HEALTHY FOOD



ESSENTIAL QUESTION

How can we prepare a healthy dish?

LEARNING OBJECTIVES

- ✓ Students will be able to explain the function of plant roots and fruits.
- ✓ Students will be able to assemble a slaw with root vegetables and fruits.

LESSON DESCRIPTION

In this lesson, students consider the importance of storage root crops in our diet during the winter, closely examine root veggies using magnifying glasses, and create a tasty root and fruit slaw. (An extra adult, such as a parent or community volunteer, would be helpful because students will be using box graters.)

MATERIALS

- Apple Cider Vinaigrette ingredients (see below)
- Small jar
- Tongs
- Materials for cleanup
- For each student:
 - Tasting cup
 - Fork
- For each group of 4–6 students:**
 - At least one root vegetable with root hairs (for observation)
 - Half a pear or apple (for observation)
 - Magnifying lenses
 - Box grater

- Cutting mats
- Container for compost
- 1 apple, 1 carrot, and 1 beet (for salad)
- Bowl

PREPARATION

- › Wash and prepare produce for students to grate.
- › Prepare a slideshow of pictures of root cellars to show students while you're discussing storage crops (optional).
- › Set up a station in the room, where all students can see you, at which you will demonstrate grating. Set out a bowl and cutting mat.

Apple Cider Vinaigrette

- ¼ cup apple cider vinegar
- ¾ cup olive oil
- ½ cup honey
- Juice of 1 lemon
- Salt to taste

GUIDING QUESTIONS

- Which two parts of the plant are we going to be eating today? How do you know?
- What interesting things do you notice about these parts of the plant?
- What can you see with a magnifying lens that you can't see with your only your eyes?

ACTION STEPS

1. Exploration: Gather students in a circle, and explain that today they're going to prepare something to eat with two parts of the plant. Say, *I'm going to see if you can guess which parts of the plant they are by doing a close observation.* Go over the Guiding Questions and then pass out carrot or beet and halved pear or apple, as well as magnifying lenses, to small groups. **(5 min.)**

2. Discussing: Ask groups to share their observations. You might discuss how you know that a plant part is a fruit if it contains seeds inside. When students mention the small hairs they see on the root vegetables, have them consider their function, asking, *How do you think the root hairs help the plant?* Discuss how they help the plant gather water and nutrients from the soil as well as anchor the plant in place. Explain, *The roots of a plant also store the sugars or food for the plant during the cold, dark months when it's not producing new food. It's just like if we buried our food underground during the winter to save it until it was warm and more food was growing. In fact, root vegetables are what we call a storage crop because people have traditionally saved them over the winter because they provide a lot of nutrients.* Show students the slideshow of root cellars, if using, and explain that people have always had to figure out ways to have enough food in the winter, when it is harder to grow things. Now we can store foods by freezing them, or we can go to the grocery store and buy foods imported from places where it is less cold, but it wasn't always that way. **(5 min.)**

3. Wash Hands Break! (5 min.)

4. Model: Demonstrate how to grate the carrot and beet onto the cutting mat, keeping your

fingers high on the vegetable and taking long strokes. Say, *Make sure to stop early! Don't worry about getting the last bit,* and show students how you stop grating long before your fingers are close to the grater. Explain to students that they'll be sharing the box graters in their groups, so it's important to make sure everyone gets a turn. **(5 min.)**

5. Grating: Pass out trays to groups of students. While students are grating fruits and vegetables, circulate through the room, keeping an eye out for safe techniques and ensuring students are sharing materials. **(10 min.)**

6. Assembling Slaw: Have a student from each group bring up their grated fruits and vegetables as you show them how to prepare the dressing. Mix the dressing with the grated produce, then taste and adjust the flavor with salt and pepper if needed. **(5 min.)**

7. Tasting: Distribute the slaw into small tasting cups for each student. Have student volunteers pass out forks and tasting cups. **(10 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *How would you describe the flavors of our root fruit slaw?*
- *What other vegetables would be good in this dish?*
- *Why are root vegetables an important food for winter time?*
- *Why do vegetables store sugar or energy in their roots?*

ADAPTATIONS

Age: For a possible extension, see the first grade lesson Root-View Cups, in which students sow seeds in clear plastic cups to observe the growth of roots.

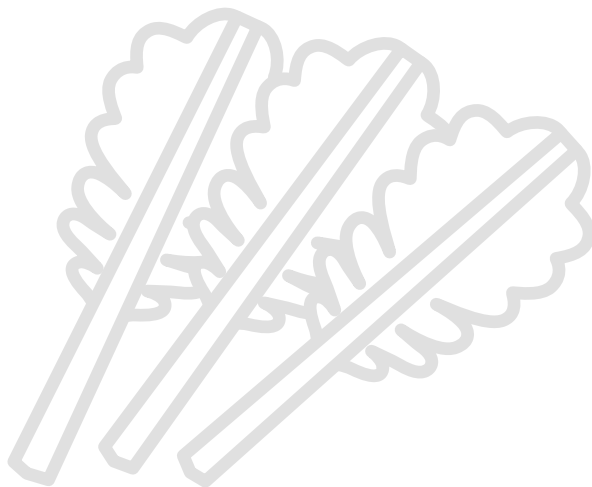
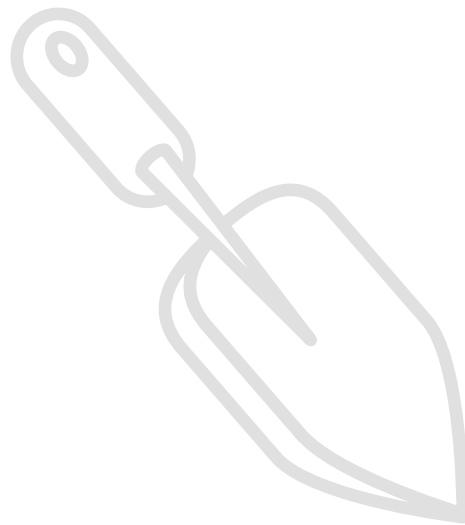
Garden: Grow carrots in the garden, and leave them in the ground over the winter to harvest in the cold season. See if your students notice the extra sweetness of their winter carrots!

ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards

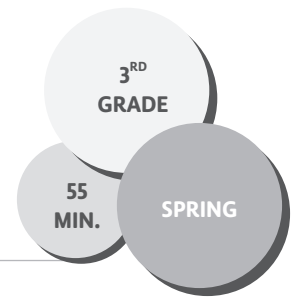
CCSS.ELA-LITERACY.SL.3.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 3 topics and texts*, building on others' ideas and expressing their own clearly.



Neighborhood Food Maps

THEME: MAKING HEALTHY FOOD CHOICES



ESSENTIAL QUESTION

Where can we access whole fruits and vegetables in our community?

LEARNING OBJECTIVE

✓ Students will be able to identify locations in their communities where they can access whole and minimally processed foods.

LESSON DESCRIPTION

In this lesson, students consider where they can access whole foods in their community, and they taste a variety of produce from different places within one mile of the school neighborhood. Students then draw a map of their school neighborhood, highlighting places where whole foods are available.

MATERIALS

- Vegetables (from 4 different places within a mile of your school)
- Photos of each place where you got the vegetables
- Map of school neighborhood
- Paper plate or blank paper for each student
- Pencils
- Colored pencils or crayons
- Chart paper or board

PREPARATION

- › Obtain a vegetable for tasting from several different places within a mile of the school

(e.g., a grocery store, a convenience store, the school cafeteria, a farmer's market, a school or community garden, a food pantry, or a donated harvest program)

- › Print out a map of a one-mile radius around the school. Highlight and label the places where you got your vegetables. Label and display photos of each place on the map. (In a dense, urban area you might choose a smaller area, such as within three blocks.)
- › Wash and prep the vegetables for students, labeling and keeping track of where you got each variety from. Students only need one or two bites of each sample.
- › Keep one whole, intact vegetable from each place to show students.
- › Create a model paper plate, divided into quadrants. In each quadrant, write the name of one place you got a vegetable for this activity.

ACTION STEPS

1. Engage: Say, *Let's see if we can name as many whole foods as possible.* Help students remember that a whole food is still in its original form, the way that it grew in a garden or farm. Then ask, *Where in our community can you go to buy whole foods?* Make a list on the board or on chart paper of student responses. As students name places, ask probing questions such as, *What else can you get here? Do they have*

lots of whole foods or just a few? Take brief notes next to each place to reflect students' understanding of these places. Explain that some neighborhoods have lots of places to get whole foods, and some have fewer, and that there are people working to make sure that every person in every neighborhood has access to whole foods in their community. **(10 min.)**

2. Labeling Neighborhood Map: Explain that you've brought in vegetables that you got from different places around the school neighborhood. Display the map and photos on an overhead or on the board. Show students each food sample, say where you got it from, and show them the location on your map. Pass out paper plates or blank paper, and show students your model. Have them divide their paper plate into even quadrants, one for each sample, and label them with the place names you showed them on your map. **(10 min.)**



3. Wash Hands Break! (5 min.)

4. Tasting: Before passing out each sample, let students know they should wait until you tell them to taste them, but they are welcome to touch and observe. Pass out samples, letting students know where each is from so they can

place it in the proper spot on their plate. Then taste the samples together, and have students share observations about each sample. **(10 min.)**

5. Drawing Food in the Community: Have students draw their own map of the school community, highlighting all the places they know they can get whole foods. Alternatively, have students write about and then discuss the following reflection question: "What could we do to add more whole foods in our community?" **(15 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- Where can we get whole foods in our community?
- What could we do to add more whole foods in our community?
- What other things besides whole foods do you think all communities should have access to?
- Which veggie did you like best? Why?

ADAPTATIONS

Cafeteria Extension: Take a "field trip" to the cafeteria, and determine what's whole and what's processed on the lunch menu.

Garden Extension: Sow seeds or starts in the garden to help students make the connection between growing plants and eating whole foods.

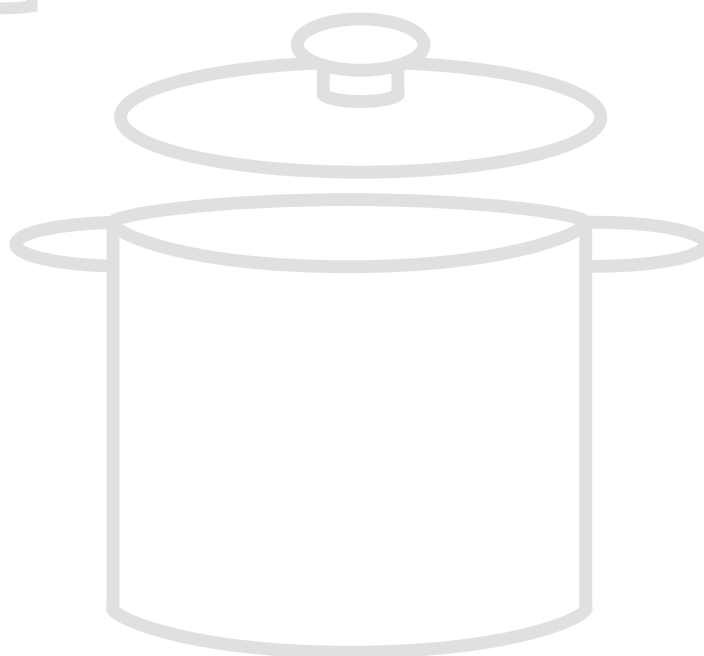
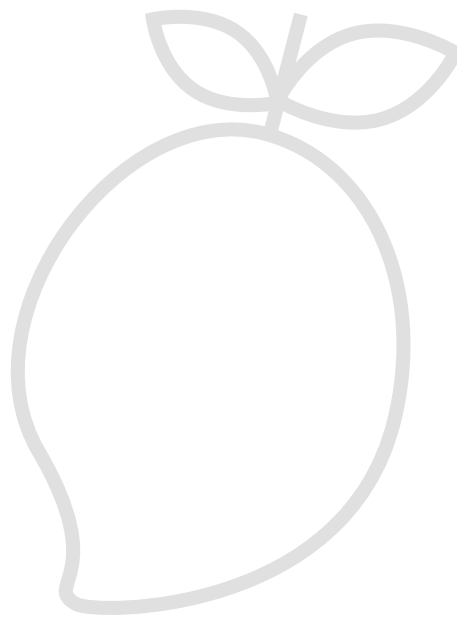
Classroom Extension: Have a guest speaker, such as a cafeteria staff member, farmer, or store owner, come in and explain to students why they stock or provide whole foods.

ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards

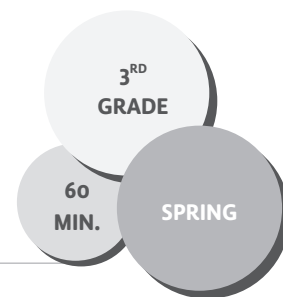
CCSS.ELA-LITERACY.SL.3.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 3 topics and texts*, building on others' ideas and expressing their own clearly.



Breaking Down Rocks, Building Up Bread

THEME: EXPLORING THE ECOLOGY OF FOOD



ESSENTIAL QUESTION

How can all the foods we eat be traced back to natural resources, including rocks?

LEARNING OBJECTIVE

✓ Students will be able to explain how diverse grains from around the world can be traced back to plants that grow in soil made, in part, from eroded rocks.

LESSON DESCRIPTION

In this lesson, students read a book about how bread is a staple food around the world. They then use a variety of props to explain how bread originates from plants, which grow in soil that is made, in part, from eroded rocks. Finally, they work in small groups to explain how different staple grains from cultures around the world can all be traced back to natural materials, including rocks.

MATERIALS

- *Bread, Bread, Bread* by Ann Morris or *Bread is for Eating* by David and Phyllis Gershator
- Rocks to Bread Props (in mason jar or zip lock bags)
- Rocks to Bread Cards (pp. 306–308)
- 5 zip lock bags (1 for each set of cards)
- Loaf of whole wheat bread, sliced (optional)

PREPARATION

- › Gather objects for props including the following:
 - › Rock
 - › something to represent wind (such as a folding fan that says “wind” on it or a paper cut-out of something blowing in the wind)
 - › something to represent sunlight (such as a fake tealight candle, flashlight, or paper cut-out of a sun)
 - › Worm in some soil or a picture of a worm (if using a real worm, make sure to add some soil and some air holes to the jar)
 - › Jar of water
 - › Jar of soil
 - › Jar of wheat seeds
 - › Jar of wheat stalks (or any grass to represent these)
 - › Jar of flour
 - › Jar of yeast
- › Copy and cut out Rocks to Bread Card sets, according to the amount of students and using blank cards if need be. Put each set into separate bags.
- › Slice bread to have a piece for each student, if using.

ACTION STEPS

1. Reading: Gather students in a circle and read a book about bread such as *Bread is for Eating*, which introduces the idea that bread is a food around the world and discusses all that goes into making a loaf of bread. Explain, *Bread is called a staple food because people eat it regularly and get a lot of their energy from it. What are other staple foods you and your family eat?* **(10 min.)**

2. Rocks to Bread: Ask students, *Do you know that bread can be traced all the way back to rocks?* Have students explain how they believe that could be, and say, *I've brought clues to show you how, but you'll have to solve it yourselves.* Ask for volunteers, and randomly pass out objects or cards that represent each part of the process. Explain that they're going to use these props to show different processes involved in making bread. The first will be rocks eroding into the soil. Ask the students not holding props to raise their hands to share props they think should be included in this process. Together, call up the rocks, sun, water, wind, worms, plants, and soil, and put these props together to describe the process of erosion and decomposition that builds soil. Now repeat that practice with the process of growing grains, having students call up the soil, water, sunlight, and grains and explaining how grains grow. Finally, have students identify the props (wheat stalks, wheat seeds, wheat flour, yeast, and water), and use these to describe the process involved in turning those grains into flour and, ultimately, into bread. Several of the items may be used more than once, for example water, which is part of erosion and a growing plant. Add props as needed for the size of your group. **(10 min.)**

3. Discussing: Ask students who arranged the props to explain their order. Ask, *What other things that you eat are made from flour?* Field responses such as pasta, tortillas, cookies, cake, and then say, *All flour comes from grinding down a whole grain or seed grown from a plant. We're going to explore other staple grains that people from different cultures eat as a regular part of their diet.* **(5 min.)**

4. Telling a Story, Small Groups: Divide students into groups, and pass out a set of cards to each group. Ask students to work in teams to use their cards to tell a story about growing that crop, starting with rocks and ending with their final dish (i.e., a tortilla or a chapati). Remind students that they'll likely need to use some of the crops in more than one place in the story. Circulate through the room while students are sorting through cards with their groups, providing guidance and support where needed. **(10 min.)**

5. Whole Class Sharing: Have each group present their story to the class. **(15 min.)**

6. Tasting: Pass out a small slice of bread to each student. As students taste the bread, have them name all the "ingredients," starting from rocks, that went into making it. **(5 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *What is a grain? What is a staple food?*
- *How did your group figure out how to get from soil to your staple food?*

ADAPTATIONS

At Home: Have students work with their caregivers to make a list of staple grains they eat at home. Then have them share these with one another or with the whole class.

4th Grade NGSS: This activity can be used in conjunction with a geology unit related to the following standard: NGSS: ESS2.A: Earth Materials and Systems. Rainfall helps shape the land and affects the types of living things found in a region. Water, ice, wind, living organisms, and gravity break rocks, soil, and sediments into smaller particles and move them around. (4-ESS2-1)

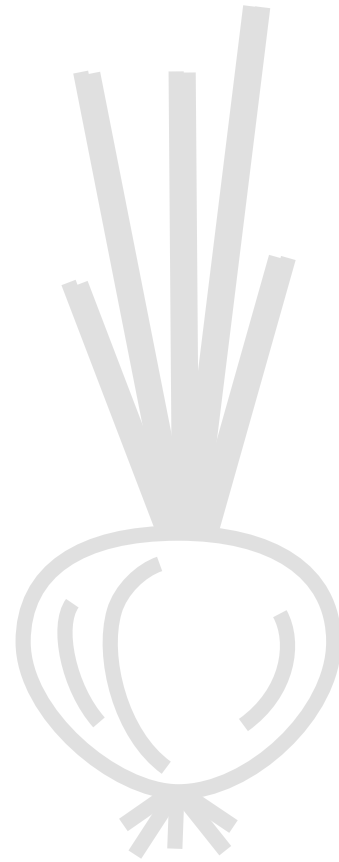
Song: Learn the song “Dirt Made My Lunch” by the Banana Slug String Band, and sing it with students.

ACADEMIC CONNECTIONS

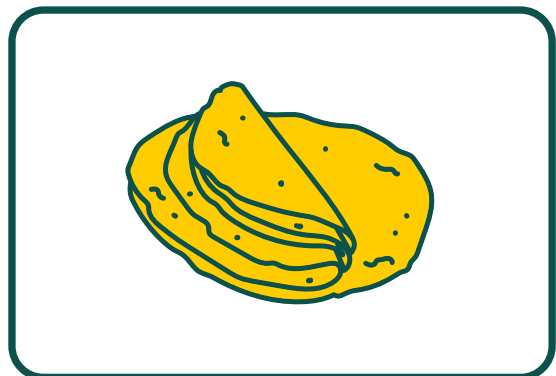
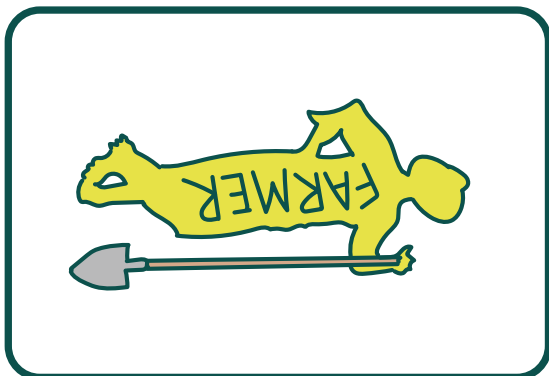
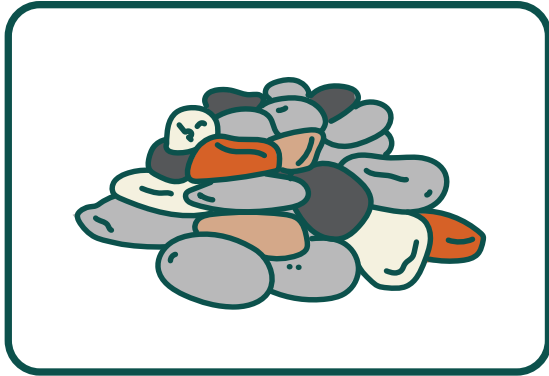
English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.RL.3.1

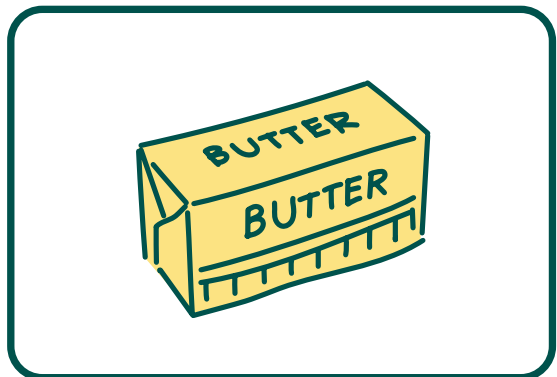
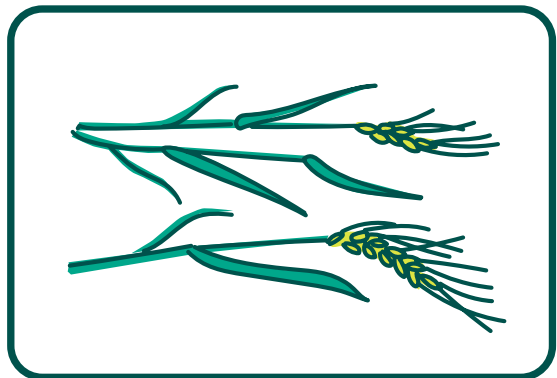
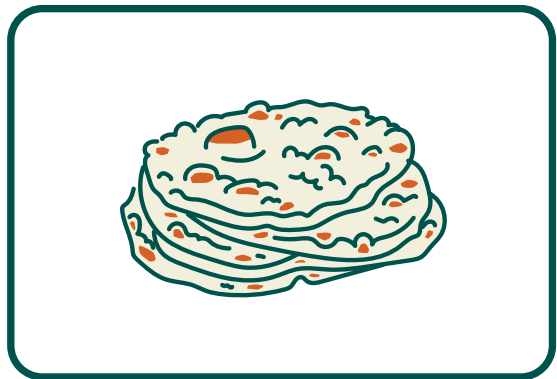
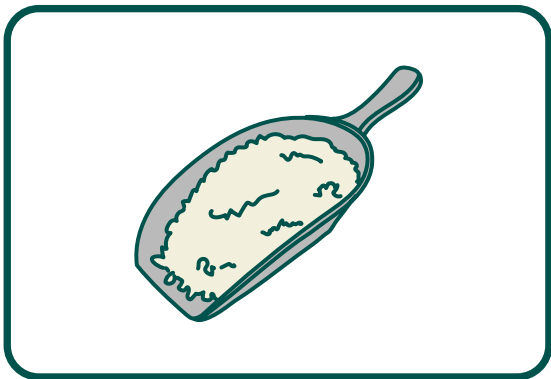
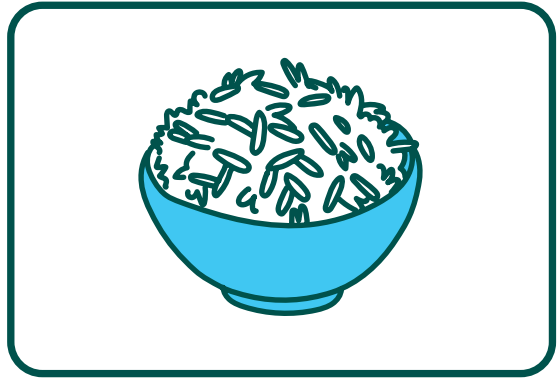
Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.



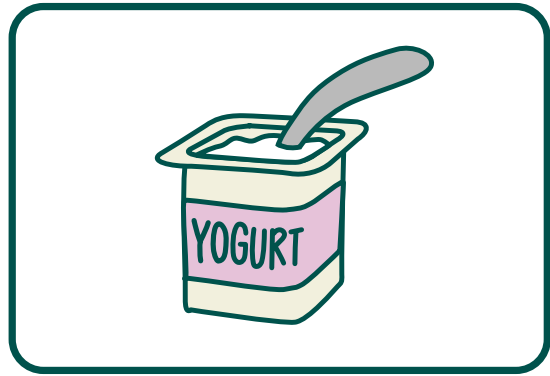
Rocks to Bread Cards



Rocks to Bread Cards

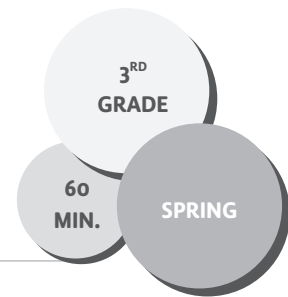


Rocks to Bread Cards



Planting the Three Sisters

THEME: GROWING AND ACCESSING HEALTHY FOOD



ESSENTIAL QUESTIONS

How are plants dependent on one another?

How do we depend on one another?

LEARNING OBJECTIVES

- ✓ Students will be able to plant a garden bed and care for it through harvest.
- ✓ Students will be able to describe the method of interplanting known as The Three Sisters.
- ✓ Students will be able to explain how plants can depend on one another.

LESSON DESCRIPTION

In this lesson, students learn about the traditional Native American planting of The Three Sisters and the accompanying legend. Students then plant a Three Sisters bed, and, in groups they devise a creative retelling of the legend to share with other students. When teaching this lesson locally, it should be planned with and informed by local native and indigenous community input.

MATERIALS

- The Three Sisters' Roles Worksheet (p. 312) for each student
- Index card for each student
- Pencils
- The Three Sisters Poster (p. 313)
- Bag of props for students to use for their Three Sisters representations
- Corn starts, bean, and squash seeds (see Preparation)

- 3–5 trowels
- 3 watering cans
- Hose (for refilling watering cans)
- Paint stirrers (as plant markers)
- Permanent marker

PREPARATION

- › Become acquainted with The Three Sisters legend, and consult with local native and indigenous communities for input on historical accuracy and cultural relevance.
- › Research what native peoples lived in your region and, if relevant, learn what variation of The Three Sisters they grew (i.e., what variety of corn, beans, and squash).
- › Consult a local planting guide to make your selection. These crops should be planted after the threat of frost has passed. If garden programming is not in session in summer, you can plant popping corn, winter squash, and dry beans to be harvested in the fall (as opposed to sweet corn, summer squash, and pole beans).
- › Because corn needs a head start from the beans and squash, plant the corn yourself two to three weeks ahead of your meeting with students, or have corn starts to plant along with the squash and bean seeds.
- › Scout a location for your Three Sisters bed. You'll want it in a place that receives direct

sunlight most of the day. There are many designs options for your bed, but a 3-foot round mound is a common practice, containing four corn plants, two bean plants, and one squash plant on the outside. If you have a large class, you might have each group plant one Three Sisters mound. But if you are teaching this lesson to more than one class, and your garden space is limited, each group within a class can plant one sister each.

ACTION STEPS

1. Storytelling: Gather students in a circle, and tell them the story of The Three Sisters. Explain, *Native Americans tell a story of three sisters who love and support each other. There is the oldest sister, Corn, who grows very tall and lends support to her younger sister, Bean, who wraps herself around her older sister. Without Corn, Bean wouldn't have a place to climb and reach closer to the Sun. Bean helps her sisters by feeding food to the soil through her roots. Then there's the youngest sister, Squash, who's happy to stay close to the ground where she can fan her wide leaves out and bathe in sunlight from down there. She helps her sisters by shading the ground, keeping the earth moist with water, and preventing other weed plants from growing. Ask, Why do you think the three crops of food that Native Americans grow are called sisters? (5 min.)*

2. Discussing Interdependence: Hand out an index card to each student. Explain, *When you have a relationship with someone or something where you each depend on one another, that's called interdependence. Have students repeat the word, and ask, We have interdependence in our families; where else do we have*

interdependence? Say, Think of someone you rely on. Describe in a sentence on your card how you depend on them. For example, maybe it's depending on a classmate to hold the door for you or a family member to take care of you when you're sick. Give students a moment to write their sentence, then say, Now turn your card over and write something you do to help that person. Have students share examples of the interdependence among their friends and family. (5 min.)

3. Explain: Pass out Three Sisters' Roles Worksheet, and show students the Three Sisters Poster. Go over the role of each sister crop, and have students match the roles to the crop on their worksheet. **(5 min.)**

4. Three Sisters Role Play: Explain to students that they'll get into groups to come up with a creative way of telling The Three Sisters story while groups take turns planting. Say, *You can create a skit, and act out the roles of The Three Sisters; you can write a poem; or you can sing a song. Explain that they should have one person be the recorder for their group, and they'll be sharing their version with the class after everyone has planted. (25 min.)*

5. Planting: Call up one to two small groups at a time to help with planting. Demonstrate tool safety and proper planting techniques for the group before you pass out seeds or starts. Have each group water their plants and identify them with plant markers **(8 min. per group)**

6. Performing: Gather students in a place where each group can present their story of The Three Sisters. **(15 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *What did you think was the most important point to get across in your retelling of The Three Sisters story?*
- *How do The Three Sisters crops depend on each other to grow and stay healthy?*
- *How do you depend on others to grow and stay healthy?*
- *What examples do you think we might see of interdependence among the three sisters crops?*

ADAPTATIONS

Cooking Extension: Create a Three Sisters meal such as a stew or tacos with corn tortillas, zucchini, and beans.

Nutrition Extension: Adapt the 1st grade lesson Go, Grow, Glow to show how each of The Three Sisters is a go, grow, or glow food. Point out to students that eating the Three Sisters together provides all the nutrients we need, which further demonstrates the idea of interdependence.

Flour Extension: Have students shuck ears of corn, and use a grinder to turn the corn into flour.

Graphic Novel Adaptation: Instead of a skit, or in addition, have your students fold a piece of paper into eight equal sections and then create a cartoon or graphic novel depicting The Three Sisters and how they help one another.

Sharing with Younger Students: Have students share their retelling of the legend of The Three Sisters to younger grades who can help with tending the beds.

ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.W.3.3

Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.

CCSS.ELA-LITERACY.RL.3.2

Recount stories, including fables, folktales, and myths from diverse cultures; determine the central message, lesson, or moral and explain how it is conveyed through key details in the text.

Next Generation Science Standards,
Disciplinary Core Idea

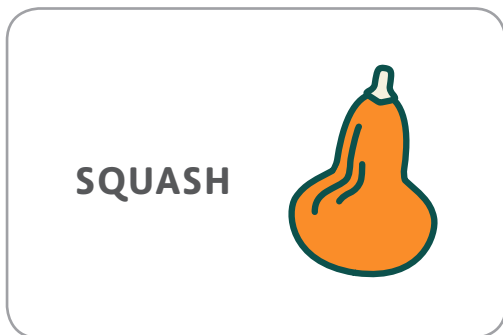
NGSS.LS2.A

Interdependent Relationships in Ecosystems
The food of almost any kind of animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. Some organisms, such as fungi and bacteria, break down dead organisms (both plants or plants parts and animals) and therefore operate as “decomposers.” Decomposition eventually restores (recycles) some materials back to the soil. Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem.

Name: _____ Date: _____

The Three Sisters' Roles Worksheet

Directions: Match each plant with what it provides to its plant sisters.



THE THREE SISTERS



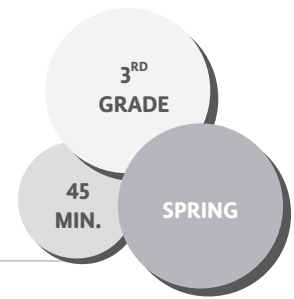
maize

beans

squash

Whole Grain Crackers

THEME: PREPARING HEALTHY FOOD



ESSENTIAL QUESTION

Why are whole grains an important part of a healthy diet?

LEARNING OBJECTIVES

- ✓ Students will be able to describe the difference between whole wheat and white flour.
- ✓ Students will be able to explain why eating whole grains is important.

LESSON DESCRIPTION

In this lesson, students learn about what comprises a whole grain through exploring different flours, comparing and contrasting white and whole wheat products, and participating in other activities. They then make whole grain flatbread crackers. (It would be helpful to have an adult volunteer to supervise students as they use the toaster oven.)

MATERIALS

- Wheat Berry Diagram (p. 317)
- Paper and pencil for each student
- Mortar and pestle (or a wheat grinder if you have one)
- 2 cups of wheat berries for grinding
- 5 small bowls, each with one of 5 different flours (buckwheat, spelt, whole wheat, all-purpose white flour, cornmeal)
- Food packaging containing whole grain and white flour ingredients
- 2–3 rolling pins (if you don't have rolling pins, students can flatten dough with their hands)

- Cracker ingredients (see below)
- All-purpose flour for dusting
- Flexible cutting mats
- 1 pizza slicer, 1 set of cookie cutters (a variety is fun, but make sure they are roughly the same size for even cooking time), or 1 knife
- Vinyl tablecloth
- Toaster oven
- Extension cord
- 2 cookie sheets
- 1 cup seeds for topping crackers (sesame, poppy, etc.)
- Materials for cleanup

PREPARATION

- › Make cracker dough. Divide the dough into four evenly sized balls (one for each group)
- › Set up four stations in the room for students to rotate through during the exploratory phase of the lesson. (See Action Step #2 below for a description of what to include at each station.)
- › Display the Wheat Berry Diagram.
- › Set up space for the toaster oven, and pre-heat it to 500°F.

ACTION STEPS

1. Introduction: Pass out a wheat berry to each student, and ask whether they know what it is. If students answer that it's a seed, encourage them to guess what plant it grows into. Say, *We're going to make crackers today! What do*

Flatbread Cracker Dough

- 1 cup whole grain flour (whole wheat, spelt, etc.)
- 1/4 tsp salt
- 2 Tbsp + 2 tsp canola oil
- 1/2 cup water
- Sea salt
- 1 Tbsp rosemary, thyme, or other herb from garden, minced (optional)

Mix flour, salt, and oil with a fork until crumbly and mealy. Add 1/4 cup water, stirring while you add. Switch to kneading by hand when dough gets difficult to mix with a fork. Add water as necessary, until dough forms a firm ball. It should not be sticky.

you think we'd need to do to turn these into crackers? Discuss students' responses. Explain, *This is called a wheat berry, and it contains the seed to plant a wheat plant, but it's also what we grind down to create flour for making bread and other baked goods.* Tell students they can chew on their wheat berries and eat them if they'd like to. **(5 min.)**

2. Drawing a Wheat Berry: Show students a wheat berry diagram, saying, *Do you know that inside a seed is a tiny baby plant ready to grow? The baby plant is called the germ. A seed is very smart! It packs all the things it needs. The bran is the protective shell the seed wears like a raincoat. It has lots of fiber that helps with our digestion. The endosperm is like the plant's lunch bag. It has starch, which is a type of sugar. This is to give the baby plant a boost of energy when it's ready to grow. It has vitamins, minerals, and protein that the plant would rely on to grow bigger. All the different parts together have vitamins, minerals, and protein. When we eat white flour, it's made just from*

the endosperm, the starchy, energy-boost part of the grain, but that means it's missing some of the fiber, vitamins, and protein from the bran and the germ. When we say something is a whole grain or whole wheat, that means that when it was processed, all three parts of the seed were kept. Have students draw their own Wheat Berry Diagram. **(10 min.)**

3. Stations: Have students rotate through stations, spending five minutes at each station. Tell students the signal you'll use, such as clapping, call-and-response, or a chime for when they should switch to the next station. Place yourself at the cracker-making station to guide students through this process. Students can work at the other stations independently. **(20 min.)**

a. Grinding Flour: While introducing this station say, *To make flour, people grind down grains. You can use a grinder or big machines, but today we're going to do it the simplest way we can.* Set out a mortar and pestle and one quarter cup of wheat berries for each group. Have students take turns using the mortar and pestle to grind the wheat berries. You might consider giving students a song to sing for each person's turn, so they know when to switch.

b. Flour Sensory Exploration: While introducing this station say, *There are flours made from different types of grain here. Feel them, smell them, just don't taste them. Count how many different colors you can find in each flour. Then see if you can figure out which are whole grains and which is white flour.* Set out bowls of 4–5 distinct flours that students can touch and smell. You can write the name of each

flour on a separate index card, and have students try to match the labels to the flours. Perhaps have the question, *Which is a whole grain?* written as a prompt as well.

c. White vs. Whole Wheat Products

Scavenger Hunt: While introducing this station, say, *Many products say “Made with whole grains!” on the package. The only way to know how true that is, however, is to read the Nutrition Facts. Look at each of these packaged foods, make a guess as to whether you’ll find whole grains in the ingredient list, and check the list to see if you were right.* Display food packaging for different wheat products, and have students find the whole grain products versus white flour products.

d. Making Crackers: While introducing this station, say, *I’ve prepared a dough with whole grain flour for us to make flatbread crackers. When it’s your turn at this station, you’ll wash your hands and then roll out the dough as thin as you can get it and add seeds. Then we’ll bake our crackers!* Set out cutting mats, rolling pins, cookie cutters, and a couple small containers of flour for dusting. Give each student a small portion of the dough ball to roll out until it’s so thin you can almost see through them. You can reroll the scraps and set them aside, or make extra if you have the extra hands and capacity. Give students the option of sprinkling seeds and/or sea salt, modeling so they don’t add too much. Bake crackers for two to three minutes, until they puff up and brown, and then flip and bake them for one to two minutes more. They burn quickly and will still be pliable until they cool, so don’t worry about underbaking them.

4. Tasting: Pass out crackers to each student. If students rotated within table groups, you can pass each group’s crackers back to them. **(5 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *What is the difference between whole grain flour and white flour?*
- *How do you make whole grain flour versus whole wheat flour?*

ADAPTATIONS

Matching Game Variation: In addition to the sensory exploration, provide students with intact whole grains to match with their corresponding flours.

Cooking Extension: If you have the time and resources, you might consider baking bread with students.

Science Extension: If you have access to whole wheat plants, have students dissect wheat berries from the chaff.

Classroom Extension: After this lesson, have students create a cartoon or poster showing the cycle of how bread or crackers are made.

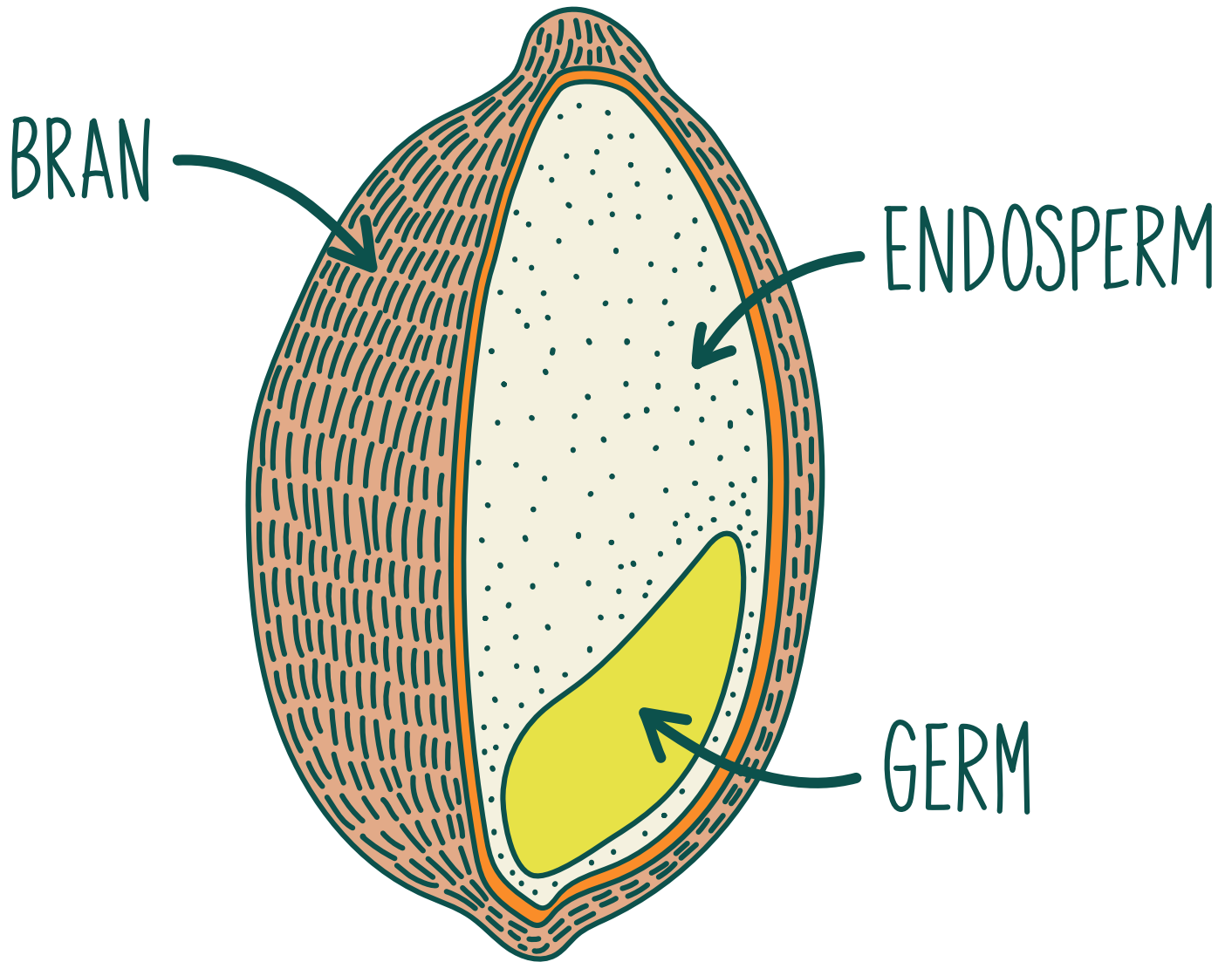
ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.SL.3.1

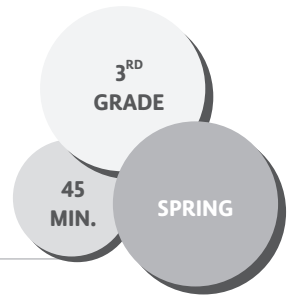
Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 3 topics and texts*, building on others’ ideas and expressing their own clearly.

Wheat Berry Diagram



Life on the Farm

THEME: CONNECTING FOOD, CULTURE, AND COMMUNITY



ESSENTIAL QUESTION

How are plants and animals involved in our lives every day?

LEARNING OBJECTIVES

- ✓ Students will be able to compare and contrast their lives to life on a farm.
- ✓ Students will be able to write rhyming poems.

LESSON DESCRIPTION

In this lesson, students consider life on a farm, and they write a poem about the role of food, plants, and animals in their lives.

MATERIALS

- *Summer Sun Risin'* by W. Nikola-Lisa
- Lined paper
- Pencils

PREPARATION

- › Write a model rhyming poem about food in your daily life or a special event to share with students.
- › Create a list of rhyming words to that students can use it to help generate their poems.
- › Display writing prompts on the board or on chart paper.

WRITING PROMPTS

A time you

- Visited a farm
- Planted seeds or a plant
- Helped in a garden
- Helped in the kitchen
- Took care of animals
- Ate a special meal
- Tried a new favorite food

ACTION STEPS

1. Engage: Ask students to brainstorm the parts of their day that include food and animals. Make a list of responses on the board or on chart paper. Now ask, *What would your day look like if you lived on a farm?* Make a second column to record these responses. Have students compare the two lists and draw some conclusions. Say, *It seems like when you live on a farm, animals and plants are a big part of your everyday life.* If your students live in urban areas, ask them how this differs from their everyday life. If there are students who currently live on a farm, let those students share their experiences. **(5 min.)**

2. Reading: Explain that you're going to read a book that shows a day in the life of a young boy who lives on a farm. Read *Summer Sun Risin'*. Next, look back at the list of activities you wrote for life on a farm, and see if you can add more from the book. **(10 min.)**

3. Model: Tell students that now they'll have a turn to write a rhyming poem based on any of the writing prompts listed above. Read your poem aloud, and ask students if they can name the rhyming pairs of words. Then you might try giving them a few different lines to practice rhyming. For example, say, *What words rhyme with raspberries? So if I said, "I love to pick raspberries," what could be my next rhyming line? (But sometimes pollen makes me sneeze! I share the garden with the bees, etc.)* Display your list of rhyming words, and say aloud each pair as a class choral reading. Encourage students to use these words in their poems or come up with their own. **(5 min.)**

4. Writing Poems: Circulate through the room, offering encouragement and guidance where needed. You may want to set a goal of writing eight to ten lines, reminding students that they're writing a first draft. **(10 min.)**

5. Sharing: Have pairs of students read their poems aloud to each other. **(10 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *What are the different chores that happen on a farm each day?*
- *Summer Sun Risin' is set in the 1950s. How do you think the story would be different today?*
- *What is a day in the summertime like for you compared to the boy in the story?*
- *How was the experience of writing your own poem?*

ADAPTATIONS

Extension: Have a farmer, farmworker, or anyone with extensive experience working on farms visit the class to talk with students about a typical day on the farm. Find a farm pen pal the class can write to. Plan a field trip to a farm.

ACADEMIC CONNECTIONS

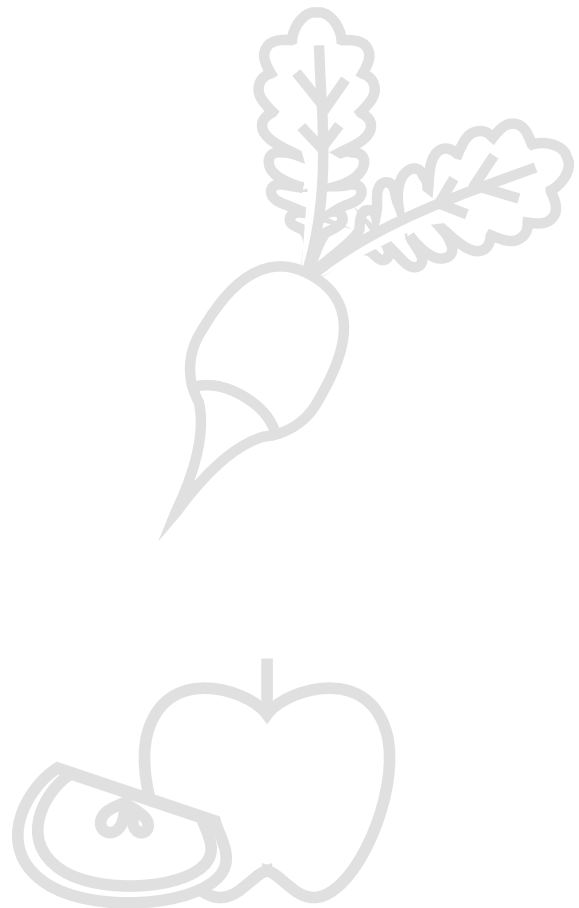
English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.RL.3.6

Distinguish their own point of view from that of the narrator or those of the characters.

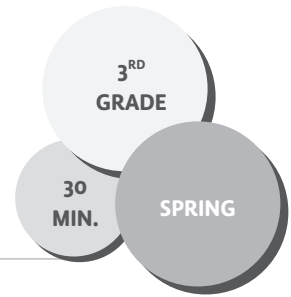
CCSS.ELA-LITERACY.W.3.3

Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences



Plant Families

THEME: EXPLORING THE ECOLOGY OF FOOD



ESSENTIAL QUESTION

How can we use observation to help us determine which plants might be related?

LEARNING OBJECTIVES

- ✓ Students will be able to explain that plant families share certain characteristics.
- ✓ Students will be able to identify characteristics that a particular plant shares with its family.

LESSON DESCRIPTION

In this lesson, students closely observe a plant leaf to determine its characteristics. Then they hunt in the garden for the plant the leaf belongs to, and then hunt for other classmates who have leaves in their same plant family. In groups, they determine the common characteristics of their plant family and share their findings with the class.

MATERIALS

- Leaves from various plants in the garden that fall into four distinct plant families
- Pencils
- Plant Families Worksheet (p. 232)
- Magnifying glasses (optional)

PREPARATION

- › Photocopy the Plant Families Worksheet for each student.
- › Gather leaves from two or more plants from different plant families in your garden. Be sure to know how many plants you have represented from each family, so you can inform students.
- › Label the plants you'll be highlighting in the lesson out in your garden (i.e., put a big, visible label saying "Kale" in the kale patch). Do not include the name of the plant family on the label.

PLANT FAMILY EXAMPLES

Brassicaceae: The mustard family	Solanaceae: The nightshade family	Cucurbitaceae: The gourd family
Kale	Potato	Cucumber
Collards	Tomato	Pumpkin
Cauliflower	Ground cherry	Squash
Broccoli	Tomatillo	Zucchini
Kohlrabi	Peppers	Melon
Asteraceae: The sunflower family	Amaranthaceae: The amaranth family	
Sunflower	Beets	
Zinnia	Lamb's quarter	
Calendula	Spinach	
Marigold	Quinoa	
Dandelion	Chard	

ACTION STEPS

- 1. Engage:** Gather students in a circle, and ask, *What's something you have in common with*

your family? How are you different from your family? Have students turn and talk to their neighbor and then share examples with the class. Explain, *We all inherit physical traits or characteristics from our ancestors, such as 20/20 vision, hair color, or height. What we learn to do with these inherited characteristics is based on our environment and the influence of the people who care about us, including our teachers, coaches, families, and caregivers. For example, you could inherit long legs, which is helpful while doing a cartwheel, but no one is born knowing how to do a cartwheel. We learn that when someone shows us how to do it.* Share your own example of a physical trait you've inherited from your ancestors, such as freckles, and then something you've learned from someone in your life, such as the ability to juggle. Have students turn and talk to their neighbor a second time.

2. Relating to Plants: Explain, *Plants are the same! They belong to families too. They share some characteristics with their family and have others that are unique, often determined by their environment.* If you have them, hold up two different plants from the same plant family, such as a kale leaf and a head of cauliflower, and ask students to share with a neighbor: *Do you think these two plants are related? Why or why not?* Then introduce the next activity: *Today we're going to look at leaves that come from different plant families represented in our garden and work together to determine which plants are related.* **(5 min.)**

3. Exploring Leaf Characteristics: Pass out a leaf and a Plant Families Worksheet to each student. Explain that once they've identified their leaf characteristics, they'll hunt for the

plant their leaf is from in the garden, but before their hunt they must show you their completed worksheet. Have students work independently to fill out their worksheet, circulating to provide support and giving permission to hunt for their leaves once they've completed Step 1. If you're concerned you don't have enough plants to go around, have students work in pairs or groups of three. **(5 min.)**

4. Finding Your Plant: Have students hunt in the garden to find the plant their leaf comes from. **(5 min.)**

5. Finding Your Plant Family: Gather students back together and explain, *Now you're going to find your plant family. You'll go around to different classmates, talking with them and observing each other's leaves until you find someone whose leaf you think could be part of your same family. Maybe their leaf is much bigger, but it is also fuzzy and has a jagged edge, for example. Then the two of you will go and find other people in your plant family.* Tell students the number of people in each group, so they'll know when to stop looking for other members of their family when they've reached five people, for example. **(5 min.)**

6. What Makes Us a Family?: If students are struggling to find their plant family groups after five minutes, step in and assist them. Once students are in their groups, have them fill out Step 3 of their worksheet, determining what characteristics they all share. Circulate among the different groups, making sure they are discussing common characteristics. Guide students with open-ended questions such as, *How would you describe the shape of your group's leaves?*

7. Whole-Class Sharing: Come back together as a class, and have each group go around the circle and share the characteristics they determined their plant family had in common. Have groups also share a couple examples of plants they determined were in that plant family. Tell students the name of their plant family if they don't know it already. **(5 min.)**

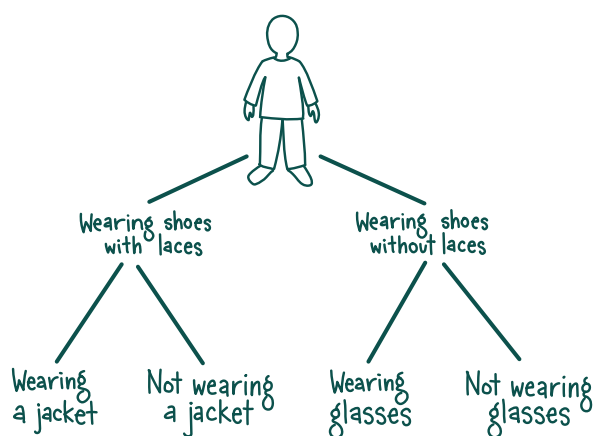
REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *How do the characteristics of your plant family help it survive?*
- *How were you able to find your plant family?*

ADAPTATIONS

People Key: You can introduce the concept of a dichotomous key by dividing your students into two groups based on an observable characteristic, such as “wearing shoes with laces” and “wearing shoes without laces” or zippers versus buttons. Focus on using articles of clothing, rather than on physical characteristics. Don't tell the class the characteristic



you're using. Let them observe and guess. Then further subdivide each group, for example, by “wearing a jacket” and “not wearing a jacket.” Diagram these groups on the board and continue on. This activity is described in more detail in Shelburne Farms' *Project Seasons* by Deborah Parrella.

Extension: Test each group's knowledge of their plant families' characteristics by giving each group a bowl of a jumble of leaves from garden plants. They then must sort their plant family from the rest of the garden leaves.

Tasting Extension: Focus on one plant family, and taste several different foods from that family, discussing how the flavors and textures are similar and different.

ACADEMIC CONNECTIONS

Next Generation Science Standards, Life Science Disciplinary Core Idea

NGSS LS3.A: Inheritance of Traits

Many characteristics of organisms are inherited from their parents. (3-LS3-1)

Other characteristics result from individuals' interactions with the environment, which can range from diet to learning. Many characteristics involve both inheritance and environment. (3-LS3-2)

NGSS LS3.B: Variation of Traits

Different organisms vary in how they look and function because they have different inherited information. (3-LS3-1)

The environment also affects the traits that an organism develops. (3-LS3-2)

Name: _____ Date: _____

Plant Families

Step 1: Observing Your Leaf

Directions: Describe the characteristics of your leaf using the prompts below.

- The texture of my leaf is _____.
- The size of my leaf is _____.
- My leaf's edges look like _____.
- My leaf's color is _____. It is (solid, speckled, spotted, striped) _____.
- Something unique about my leaf is _____.

Once you've completed Step 1, show an adult, and ask for permission to go and find your plant!

Step 2: Finding Your Plant

What plant do you think your leaf comes from?

Step 3: Finding Your Plant Family

Directions: Once you've found your plant family, discuss what you all have in common!

What makes us a family? Our plant family shares these characteristics:

1. _____
2. _____
3. _____

What are the plants you think belong in this family?

1. _____
2. _____
3. _____
4. _____
5. _____



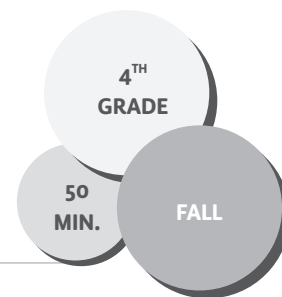


Fourth Grade

LESSONS

Food Memory Tourists

THEME: LIVING UP TO OUR FULL POTENTIAL



ESSENTIAL QUESTION

How does food influence our memories of life experiences?

LEARNING OBJECTIVES

- ✓ Students will be able to orally describe memories using sensory detail.
- ✓ Students will be able to write and revise narratives to incorporate sensory detail.

LESSON DESCRIPTION

In this lesson, students use sensory description to write about a food memory, engage in guided sensory tours of their memories with a partner, and share their memories with the class.

MATERIALS

- Paper
- Pencils
- Highlighters (optional)
- Food Memory Prompts to distribute or project

PREPARATION

- › Write about your own food memory as a model (see below in Action Steps for details).
- › Display prompts on board or chart paper.

FOOD MEMORY PROMPTS

- The first time you had your favorite food
- An event where you ate a dish important to your family or culture
- A time when someone you loved made you something delicious
- A time you ate/prepared something, and it didn't go as planned
- The first time you cooked something really tasty on your own
- A time when you tried a food you didn't think you'd like and were surprised

ACTION STEPS

1. Freewriting: Explain that today we're going to be exploring and writing about food memories: *Food is important in our lives because we all eat, but we all have different ways that we make and enjoy food. Writing and sharing about food is important, too. Passing down food stories and recipes is an important tradition for many communities. Say, The idea of a free write is to let the ideas flow!* Encourage students not to lift their pencils from their papers for five minutes straight, but write whatever comes to mind relating to food and the prompts that you give them. Let them know that this won't be graded for grammar or punctuation. Start the timer, and read aloud each writing prompt one at a time, allowing for significant wait time between each one. **(5 min.)**

2. Guided Sensory Tour: Explain that students will be sharing as much of their memory as they feel comfortable sharing with their partner, but instead of reading aloud their free writes, they're going to share by taking their partner on a tour of a food memory that came up during their free write. Say, *You'll pretend that the classroom is the place where your food memory happened, and you'll guide your partner through the space. You'll have to use lots of description, and help your partner use their imagination to hear, smell, see, and taste all that you did when you had the experience.* Model by taking the teacher or a student volunteer on a guided sensory tour of your own food memory. For example, *We're in my grandma's kitchen. Here's the kitchen counter. It's a dark brown color. Can you smell the green dish soap my grandma always used?* Tell partners that once they begin, they're free to use the space in the classroom (unless there are parts that are off limits, such as the teacher's desk) to take their tour, but they should be mindful of other students in the space. After five minutes, have pairs switch and the other partner give their sensory tour. **(10 min.)**

3. Revising: Explain that now that students have given sensory tours of their food memory, they probably have more details to add to their writing. Have students use their free write to write a new draft of their one specific food memory, incorporating details from the guided tour exercise they gave to their partner. After writing, have students share with their partners who can prompt them to include any details they gave during the tour, which they may have missed in writing. You might also have students use highlighters to highlight any details that relate to the five senses. **(15 min.)**

4. Sharing: Explain that you're going to be sharing food memories. Say, *The food we like and the way our family eats feels personal. Remember to be open-minded and to listen attentively. In other words, "Don't yuck my yum!" and "One diva, one mic."* Have students share their writing in small groups. Encourage every student to share, even if it's just one paragraph or sentence. **(15 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *Why is food so important in our lives? How are your classmates' food memories similar to your own? How are they different?*
- *How did it feel to share your food memory? When you gave your sensory memory tour, what senses did you remember? Smells? Sights? Sounds? What helped you imagine someone else's memory?*

ADAPTATIONS

At Home: Have students write recipes that connect to their food memory. Collect the recipes and create a class recipe book.

ACADEMIC CONNECTIONS

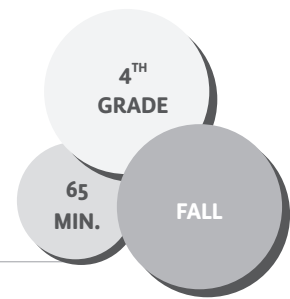
English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.W.4.3.D.

Use concrete words and phrases and sensory details to convey experiences and events precisely.

Poetic Produce

THEME: MAKING HEALTHY FOOD CHOICES



ESSENTIAL QUESTION

How can our experience of food inspire creativity?

LEARNING OBJECTIVES

- ✓ Students will be able to explain that various fruits and vegetables, such as tomatoes, have different varieties.
- ✓ Students will be able to describe different produce varieties in detail.
- ✓ Students will be able to collaborate on a creative expression piece.
- ✓ Students will be able to define “preference,” identify tastes and textures that they prefer, and explain that different people have different food preferences.

LESSON DESCRIPTION

In this lesson, students mindfully taste and describe produce varieties at stations around the room. They then collaborate in groups to develop a poem, song, or skit incorporating all the descriptive words the class generated about each variety. After performing, the class will consider how everyone has different preferences that inform what they like to eat.

MATERIALS

- Samples of 4–5 varieties of a single type of fruit or vegetable, such as varieties of apples, tomatoes, or salad greens
- Brown paper bags
- Toothpicks (at least 4 for each student)
- Slips of paper (at least 4 for each student)

PREPARATION

- › Slice produce into enough small pieces for each student to try each one.
- › Set up tasting stations around the room. If you have a large class, you might opt for five stations to limit the amount of students in each group. Number each station, and display the name of the variety at the station. Each station will need a distinct produce variety, toothpicks, a brown paper bag, and enough slips of paper for each student to have one. Write the corresponding number and variety name on a slip of paper, and place it in the bag.

ACTION STEPS

1. Wash Hands! (5 min.)

2. Taste and Describe Stations: Tell students, *I have different varieties of apples for us to try at different stations around the room. You'll visit each taste station, mindfully trying the slice of apple and paying close attention to the texture,*

flavors, and what it reminds you of. Then each of you will write a word or phrase, with a three-word maximum, on a slip of paper to describe your personal impression of that particular variety. When I say “switch,” you’ll move on to the next station. Remind students to only take one piece at each station and to only touch the slice they’re going to eat. Assign groups of students to start at various stations—these will be students’ working groups for the rest of the activity. After several minutes, call out “switch,” and have students rotate clockwise to the next station. **(12 min.)**



3. Explain the Activity: Once everyone has tried each variety, mix the bags around, and assign one to each group of students. Explain, *Your group will now create a written piece of art, using all the words in your bag. Feel free to write a poem, a story, or a skit; use any genre of writing. You can add additional words if you need to, but if a word like speckled has been written on five different pieces of paper, you’ll have to include speckled five times in your written piece.* Explain that each group will perform their song, poem, or skit for the class, who will try to guess which variety they’re describing. Therefore, it’s important that they keep their variety a secret. **(3 min.)**

4. Group Writing: Tell students they’ll have about fifteen minutes for writing and brainstorming and five minutes to do a couple rehearsals before sharing their piece. As students are working in groups, circulate through the room to check in and ensure they’re on track. After fifteen minutes, ask them to get on their feet and practice their piece, making sure each member of their group has a role. **(20 min.)**

5. Performing: Have each group perform for the class, allowing the audience to guess which variety was being featured in each performance. Reveal the varieties after all groups have performed. **(15 min.)**

6. Voting: Remind students to consider that each person’s unique perspective is represented in each poem. Ask, *Based on these poems, which variety seems most favored by the class? Which seemed least favored?* Ask students to define the word “preference,” and consider their own preferred variety. Take a heads-down vote on which variety was their favorite, and discuss the findings. **(5 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *Why is it important to try different varieties of a particular fruit or vegetable?*
- *How did your group collaborate to create your poem, song, or skit?*
- *What challenges came up in your groups? How did you overcome them?*

ADAPTATIONS

Garden: Adapt this activity for students to hone their observation skills in the garden. Set up the writing stations at four different garden beds or different herbs or pollinator shrubs.

Language: Have students include words from different languages that they know, including the English version. For instance, “*rica* delicious.” Later, when groups craft their poems, they’ll have to use both words.

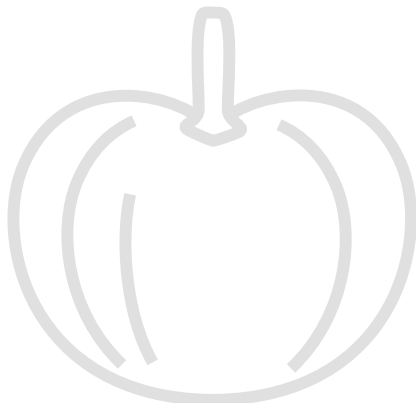
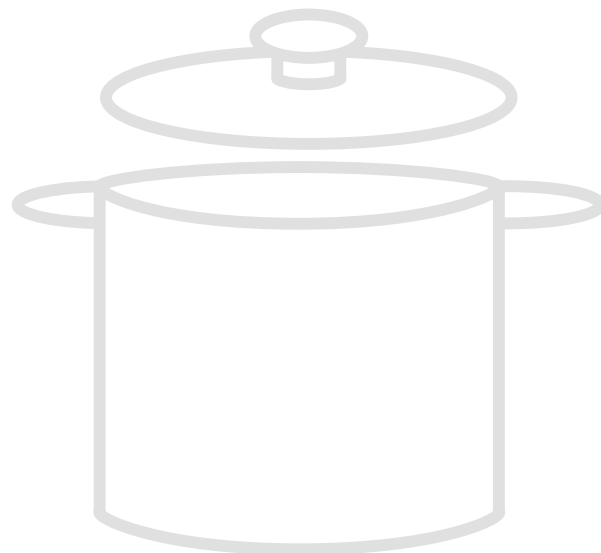
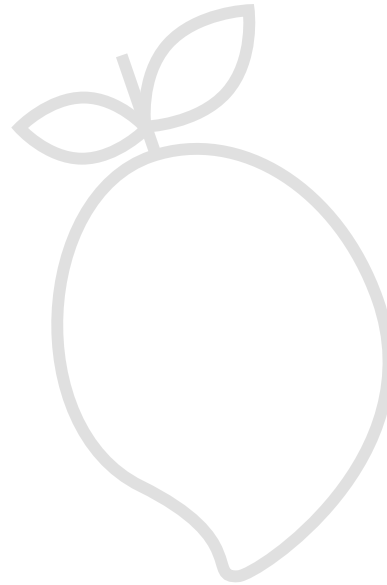
Classroom: Have a station in the classroom where students will find a new, uncommon fruit or vegetable each week. Have them record their observations based on the five senses and then write a poem or story about it.

ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.W.4.3.D

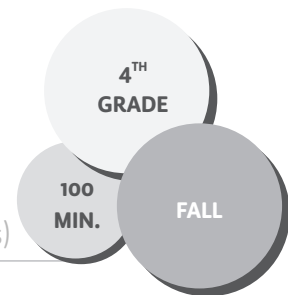
Use concrete words and phrases and sensory details to convey experiences and events precisely.



Get to Know a Crop

THEME: EXPLORING THE ECOLOGY OF FOOD

(divided over two sessions)



ESSENTIAL QUESTION

How do we determine whether we should grow a crop in our climate?

LEARNING OBJECTIVES

- ✓ Students will appreciate the diversity of crops that make up our diets.
- ✓ Students will be able to compare and contrast characteristics of various crops and relate these to the climates in which the crops grow.

LESSON DESCRIPTION

This is a research project, and the time can be split over multiple sessions or shared with the classroom teacher. In this lesson, groups of students think like a farmer and research a crop to determine whether they should grow it. After learning the crop's history and how it's grown and used, students prepare and present arguments to their classmates on whether this crop should be grown in their region.

MATERIALS

- Horticulture reference books
- Library and/or computer cart
- Group Role Cards (p. 334)
- Chart paper and art supplies (optional, if you want students to create a visual of their crop for presentations)

PREPARATION

- › A week before the lesson, ask the school librarian to pull some horticulture books and other resources that will help your students research crops. You may also want to reserve books from your local library.
- › Schedule a class visit to your school's library during class time and/or reserve computers.
- › Photocopy and cut out a set of Group Role Cards for each group of 3–6 students.
- › Display sentence starter: "If we were farmers, we would/would not grow this crop because _____."

ACTION STEPS

1. Growing a Farm Game: Explain to students that they're going to play a game to think of as many fruit and vegetable crops they can think of. Sitting in a circle, Explain, *The first person to go says, "I have a farm and I'm growing" something that starts with an A like artichokes. The next person who goes will have to say, "I have a farm and I'm growing artichokes and . . ." then they add something that starts with a B, like "blackberries."* The game continues around the circle with every letter of the alphabet, and it becomes more of a challenge to remember all the other items on the farm. If you get stuck, you can ask the class to help you remember. If you have a large class, you might want to divide the class in half to play the game. **(10 min.)**

2. Explain the Activity: *Today I want you to think like a farmer and determine whether you'd grow a crop that you're interested in after you've researched and learned more about it. Ask, What do you think are good reasons for growing certain crops over others?* Create a list together as a class. The list might include, taste, thrives in our climate, ease of growing and tending, ease of harvesting, is unusual, is well-loved/popular with customers, etc. Explain, *With a group, you'll decide on which crop you'll research. Each member of the group will research something different—whether it can be grown locally, where it originated, its traditional uses, how it's prepared and eaten, its history, if it's sold locally, etc. Then you'll prepare an argument for why a local farmer should or shouldn't grow the crop you researched.* Ask students to write the name of a fruit or vegetable they'd like to research to bring to their group. **(5 min.)**

3. Assign Groups: Assign groups and have students decide together what crop they'll research. You might have them select one of their individual choices at random out of a container if they're having a hard time deciding. Give each student or pair of students a role card. **(5 min.)**

4. Researching: At this point, you should either bring students to the library or computer lab, or provide access to a computer cart and the resources you've collected for them. Reassure them they might not find answers to all the questions, but they should write any information that helps. **(30 min.)**

5. Preparing Arguments in Groups: Have students meet with groups and take turns sharing the information they learned about their crop

with each other. Give students the sentence starter, "If we were farmers, we would/would not grow this crop because _____." Ask them to have at least three reasons. If you have time, you might pass out chart paper and markers for students to draw a picture of the crop and list their three reasons. **(15 min.)**

6. Stand up If: Explain that you're going to name a quality, and their group should stand up if it applies to them. Say things like, *I'm a crop that thrives in cold weather. I'm a crop that is locally grown in our state. I'm a crop that is grown in our county. I'm a crop that is native to this land. I'm a crop that was historically grown in another country. I am often cooked into soups. I give you lots of vitamins and minerals.* For each group that stands up, have the group members name their crop so students are able to compare and contrast the crops. Then play the same game with statements that make connections between the crops they studied and the students themselves, such as, *I have eaten kiwis before, or I have never tried eggplant but I would like to, or Someone in my family cooks with carrots.* **(10 min.)**

7. Sharing Arguments: Have each group present why they would or wouldn't grow this crop, sharing their three reasons and visual, if they made one. **(20 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *What was the most interesting thing you learned about the crop you researched?*

- *What are the different factors a farmer should consider before growing a particular crop?*
- *If you were a farmer in our area, which crops would you grow and why?*
- *What is a crop you learned about today that you have experience with? What is a crop that you would like to try?*
- *If you were one of these crops, which one would you be and why?*

ADAPTATIONS

Variation: If you have a relationship with a farmer, you might assign groups particular local crops that they'll research. Arrange for the farmer to visit, bringing in the crops your students researched. Have the farmer explain why they chose those particular crops, what they like and dislike about growing them, how the crops did this growing season, etc.

Garden: Have the students plant the crops that they agreed would do well in their region in their school garden and observe them growing over time.

Review from Prior Lessons: For each crop researched, ask students which part of the plant people eat (i.e., carrots = roots; lettuce = leaves). Have students look at the colors of the crops they researched, and review the value of eating a rainbow of natural colors for overall health.

Cooking: After each group has presented, challenge groups to think about all the crops they learned about and how they might be integrated into a dish. Groups can share recipe

ideas and come up with a dish they'll make as a class, incorporating all ingredients.

Field Trip Extension: Plan a field trip to a local farm to learn about crops that are grown locally.

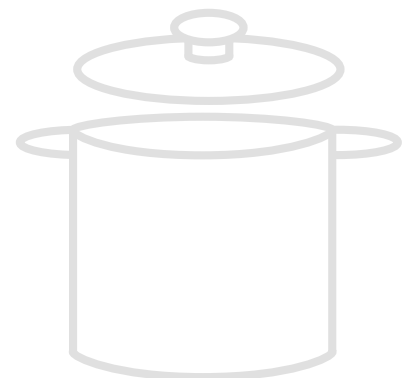
Art Extension: Show students sample Harvest of the Month posters, and have them create a poster for their chosen crop.

ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.RI.4.9

Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably.



Group Role Cards

How _____ Is Grown

What type of climate does this crop grow in?

What USDA zone does this crop grow best in?

How long does this crop take to germinate?

How long does it take for the crop to grow before it's harvested?

How _____ Is Prepared and Eaten

What steps do you take to prepare this crop to be eaten?

What are popular recipes that include this crop?

What is the nutritional value of this crop? (What vitamins does it contain? Is it a go, glow, or grow food?)

Does this crop have any other traditional uses?

The History of _____

What country and/or region was this crop originally grown in?

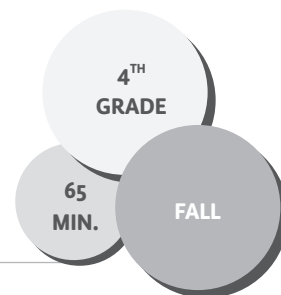
What people is this crop traditionally eaten by?

When was this crop first introduced to our region?

Is this crop currently grown in our region?

Agents of Change

THEME: GROWING AND ACCESSING HEALTHY FOOD



ESSENTIAL QUESTION

How can we be agents of change within our school?

LEARNING OBJECTIVES

- ✓ Students will be able to identify problems in their school and suggest possible solutions.
- ✓ Students will know that they can create change.

LESSON DESCRIPTION

In this lesson, students hear about an activist who created change in the food system. They then brainstorm issues around food and health in their school community and work in teams to generate solutions and action steps they could take to be agents of change. This lesson is a springboard for student-initiated projects, and it is ideally led with significant input and support from the classroom teacher. It is important to have a plan for supporting students after the lesson with opportunities to take action on the projects they design, such as in a subsequent class period or during a lunchtime club when students can work together on tasks such as letter-writing campaigns, posters for the school, or action steps to instigate change.

MATERIALS

- A picture book about a food activist such as *Harvesting Hope: The Story of Cesar Chavez* by Kathleen Krull

- Chart paper
- Tape (masking or painter's)
- Markers
- Action Steps and Outcomes Worksheet (p. 339)
- Action Plan Worksheet (p. 338)

PREPARATION

- › Hang chart paper throughout the room, labeling each with different issues that might arise in school related to food and health: Cafeteria Space, Lunch Food, Recess, Snack Program, Waste and Recycling, Physical Education, School Culture, Garden, and Other.
- › Photocopy the Action Steps and Outcomes Worksheet and Action Plan Worksheet for each team of 3–4 students.

ACTION STEPS

1. Reading a Real-Life Story: Gather students in a circle, and explain that you're going to read a story about someone who saw an issue in their community and took action. Read a book about a historical food activist, such as Kathleen Krull's *Harvesting Hope: The Story of Cesar Chavez*. **(10 min.)**

2. Brainstorming Issues: Say, *If we were to focus on the issues at our school around food and health, what would they be?* Show students that you've hung chart paper throughout the room. Pass out markers and instruct them

to add issues to the chart paper under the appropriate category. Demonstrate with an example, such as by writing, “There aren’t enough balls for everyone to play four square at recess” on the Recess poster. **(5 min.)**

3. Identifying Action Steps and Outcomes:

Have students return to their desks and say, *It probably feels good to express some of those issues out loud, but we don’t just want to rant or complain. We want to figure out how we can do something about these issues.* Display the Action Steps and Outcomes Worksheet. Say, *Once we identify an issue, it’s important to figure out what we want to see happen instead. That would be our desired outcome.* Have pairs of students discuss real examples from the story they heard at the beginning of class. Have students identify the issue the activist saw, the steps they took, and the outcomes of their actions. Have students share what they discussed. **(5 min.)**

4. Practicing Finding Solutions: Select one of the issues from the chart paper to examine as a class. Ask students to discuss in teams of three or four: *What would be your desired outcome?* Have teams share, and make note of their responses. Then ask, *What steps do we need to take to make that change happen?* Encourage students to think of concrete, immediate steps they can take. If students need guidance, you might ask *What’s causing this problem?* Or *Who in our school community needs to know about this problem?* But let the ideas for solutions come solely from students. **(5 min.)**

5. Sorting into Teams: Tell students now that they’ve practiced together as a class, they’ll have a chance to work on the issue they feel

most strongly about. Have students self sort into teams based on the issue they’re most interested in. Explain that when you give the signal, they’ll get up and stand next to the chart paper that contains their issue. Give the disclaimer that there should be no more than four people in each group, and if they’re not self-sorted after three minutes, you will help them find a group. If more than four people want to work on one issue, have them divide into multiple teams, each with up to four students. These teams can work on the same issue. Give the signal, and set the timer. **(5 min.)**

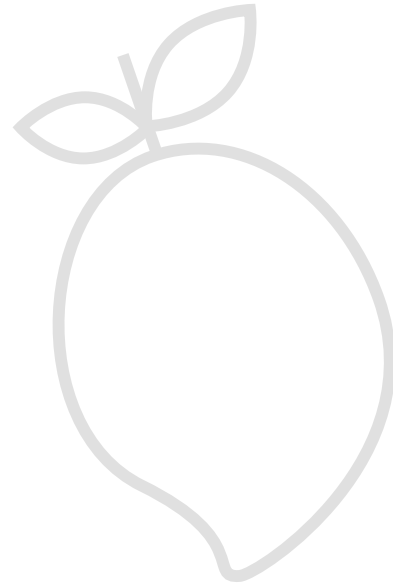
6. Finding a Solution: Once students are settled into their groups, assign or have them self-select roles. Each group could have the following: a recorder to take notes, a time manager to keep the group on task, a facilitator to ask questions and make sure everyone’s voice is heard, and a presenter to share information with the class. Have students determine the specific problem they’ll be tackling. Then have them work together to fill out the Action Plan Worksheet. Say, *Make sure that everyone’s voice in your group is heard. For instance, if you’ve just shared a lot about how you feel, it’d be nice to then ask someone on your team their opinion.* Circulate through the room, ensuring students are taking detailed notes and that all team members are getting air time. **(15 min.)**

7. Sharing Action Plans: Have each team report to the class. Have team representatives share the issue they decided to work on and what action steps they determined would lead them to their desired outcome. **(15 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *What other examples of citizens who've been agents of change can you think of?*
- *What strategies did your team use to hear from everyone?*
- *How did your team come to consensus on how to approach your problem?*
- *Why is it important to consider your desired outcome for a problem before taking action?*



ADAPTATIONS

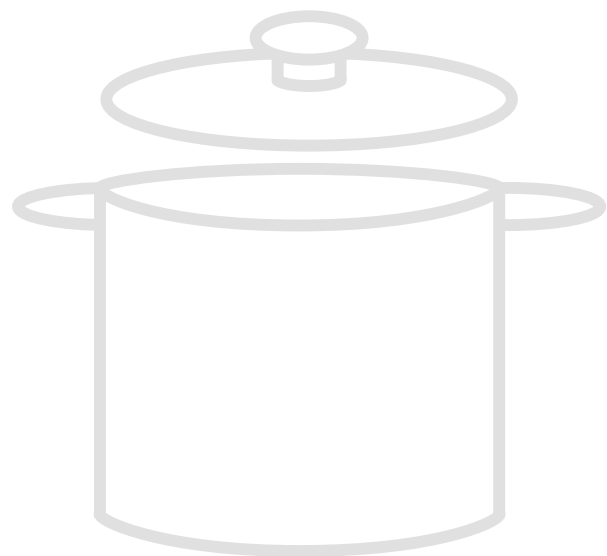
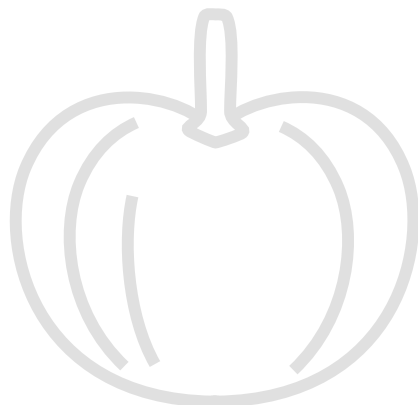
Classroom Extension: Have each team become an action group for their chosen issue. Have them meet once a week to check in on their progress toward their desired outcome, using the Action Group Log.

ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.SL.4.4

Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.



Names: _____ Date: _____

Action Plan Worksheet

Directions: Fill out the following with your team.

The problem we chose is

We chose this problem because

Instead, we want to see

We believe what's causing the problem is

The first step we'll take is

The next step we'll take is

The next step we'll take is

We'll know we've made an impact when

Names: _____ Date: _____

Action Steps and Outcomes

PROBLEMS

ACTION STEPS

OUTCOMES

	↓		↓	
	↓		↓	
	↓		↓	

Action Group Log

Names: _____ Date: _____ Week: _____

What have we accomplished since our last meeting?

What do we need to follow up on?

What goals do we have this week?

Who do we need to contact or get support from this week?

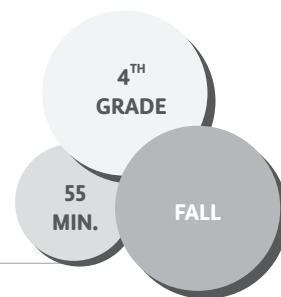
What resources do we need?

TO DO:

- | | |
|-----------|--------------------------|
| #1 | Who will do this? |
| #2 | Who will do this? |
| #3 | Who will do this? |

Choose-Your-Own-Flavor Popcorn

THEME: PREPARING HEALTHY FOOD



ESSENTIAL QUESTION

How can we balance flavors in a dish?

LEARNING OBJECTIVES

- ✓ Students will be able to identify the flavor profile of various herbs and spices.
- ✓ Students will be able to blend flavors to create a custom popcorn seasoning.

LESSON DESCRIPTION

In this lesson, students explore the five flavor profiles, identifying and sorting ingredients in teams and working collaboratively to create a custom popcorn seasoning.

MATERIALS

- Popped popcorn (see Preparation)
- Olive oil (for drizzling)

A tray with the following for each group of 4–6 students:

- 1 large bowl for popcorn
- 1 small bowl for each student
- Large spoon or tongs for stirring
- Small paper tasting cups of individual herbs or spices, representing a sample of each flavor profile in the 5 Flavor Profiles chart below, for example:
 - **Bitter:** finely chopped rosemary, grapefruit zest
 - **Sweet:** honey or sugar (choose one, and provide only a small amount in one tasting cup)
 - **Spicy:** chili powder, cinnamon
 - **Sour:** lime wedges
 - **Salty:** sea salt
- 1 spoon for each tasting cup
- Scratch paper and pencils

PREPARATION

- › Pop popcorn. Typically ¼ cup of kernels produces about 8 cups of popcorn, so you'll likely have to make three to four batches.
- › Just before class, drizzle the popcorn with olive oil, and distribute it into one bowl for each group of 4–6 students. Prepare trays for groups of students.

5 FLAVOR PROFILES

Salty/Umami

Sea salt
Soy sauce
Dried seaweed
Nutritional yeast
Parmesan cheese

Bitter

Rosemary
Thyme
Peppermint
Grapefruit zest
Cocoa powder

Spicy

Chili powder
Hot sauce
Cinnamon
Cumin
Curry powder

Sweet

Honey
Maple syrup
Brown sugar

Sour

Lemon or
lime juice

ACTION STEPS

1. Engage: Tell students that today they'll be working with the five flavor profiles in cooking to create their own popcorn seasoning. Have students turn and talk to see if they can name all five. Share as a class. **(5 min.)**

2. Wash Hands Break! (5 min.)

3. Exploring Flavors: Explain that you've prepared different herbs, spices, and ingredients that fit the five different flavor profiles, and in teams they'll

need to figure out which belongs in each profile group. Explain, *I'll give each team five scraps of paper. Your task is to sort the ingredients into five distinct groups. On each paper, write the flavor, such as bitter, and then all the ingredients you can identify that fall under bitter.* Demonstrate how to use a spoon to put a small pinch of one item into your hand without touching or licking the end of the spoon. Then smell, observe, and taste the ingredient to figure out what it is and what flavor profile it matches. Remind students that the spoons are to share, so they shouldn't touch the serving end. Also remind them to save some of each flavoring for their popcorn. Pass out trays and circulate through the room as students work in groups, asking guiding questions such as, *Does this herb smell familiar to you? In what dish have you smelled or tasted this spice before?* **(10 min.)**

4. Discussing Flavors: Go over each flavor profile as a class, having groups take turns sharing the identified herbs and spices. As you review ingredients, share information with students, such as how bitter herbs like peppermint can help your stomach digest foods. After you've gone over each flavor, discuss combining them. Ask, for example, *How would you balance sweetness in a dish?* Discuss different popular flavor combinations students might be familiar with, such as sweet and sour sauce from Chinese restaurants or chili and lime on fruit in Mexican cuisine. **(10 min.)**

5. Creating Custom Popcorn Seasoning: Explain that student teams will now create their own custom seasoning for their team bowl of popcorn. Model with your own bowl (e.g., sprinkling salt, squeezing lime juice, and distributing a pinch of chili powder over your bowl). Stir with a spoon and sample, demonstrating how you adjust the flavor for your taste. Tell students

they'll have five minutes to work with their team to create their seasoning. Pass out bowls of popcorn to groups of students, and have them prepare their own custom blend. **(10 min.)**

6. Tasting: Have students wait until you tell them to eat their popcorn. Encourage students to share some of their popcorn with other groups to taste a variety of combinations. **(10 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *What did you use for your seasoning? What were your favorite flavor combinations? How do some of your favorite dishes combine the flavor profiles?*
- *How would you teach someone else to make a flavorful popcorn seasoning?*

ADAPTATIONS

Garden Setting: Split students into teams, and have them hunt for herbs and other items in the garden, finding as many of the flavor profiles as they can. Remind them only to taste with adult permission to ensure that they don't pick and eat anything poisonous.

ACADEMIC CONNECTIONS

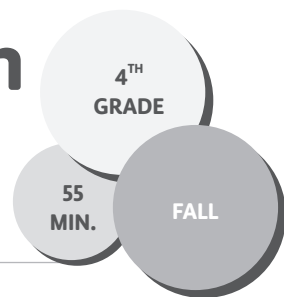
English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.L.4.5.C

Demonstrate understanding of words by relating them to their opposites (antonyms) and to words with similar but not identical meanings (synonyms).

Getting to Know the Garden

THEME: LIVING UP TO OUR FULL POTENTIAL



ESSENTIAL QUESTION

How can we explore the garden respectfully?

LEARNING OBJECTIVE

✓ Students will be able to use their senses to familiarize themselves with features in the garden.

LESSON DESCRIPTION

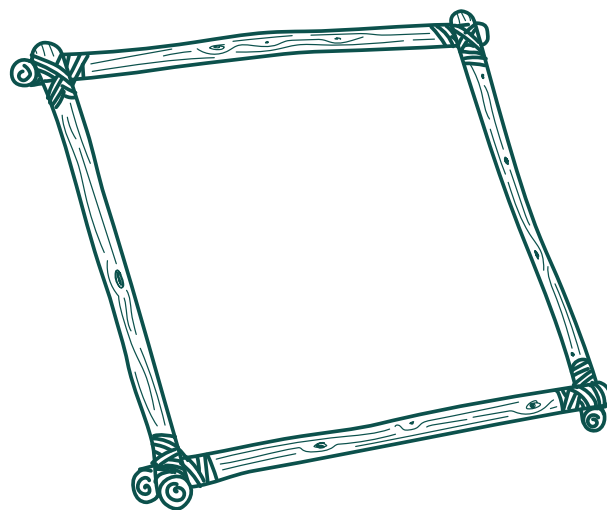
This lesson serves as an introduction to the garden for upper grades, so adapt it accordingly for third or fifth grade. Students discuss expectations in the garden, play garden bingo, and then move through rotations of activities meant for them to thoughtfully engage with the plants and other living things in the garden.

MATERIALS

- For each student:
 - Fall Garden Bingo Worksheet
 - Clipboard
 - Pencil
- An empty 1 foot by 1 foot square, or quadrat (see Preparation)
- 4–5 trowels
- Full roll of painter's tape
- Yardstick, ruler, or measuring tape
- String
- Paint stirrers
- Magnifying glasses (optional)

PREPARATION

- ▶ Photocopy full set of Fall Garden Bingo Worksheets, multiplying the amount so there's one for each student. Shuffle the sheets, so they can be handed out at random.
- ▶ Choose two or three Station Rotations from those listed below. Designate an area in the garden for each station.
- ▶ To prepare for Life in a Square Foot, create a quadrat by cutting a 1 foot by 1 foot square out of a piece of cardboard. Alternatively, glue, tape, or tie long sticks together to create a 1 foot by 1 foot square.



ACTION STEPS

1. Garden Expectations: Gather students in a circle and say, *Today we'll get to explore the garden, which is our outdoor classroom. What are the expectations we can follow to make*

sure we can learn all we can and keep ourselves, the plants, and other living creatures safe? Have students share expectations and collectively come to an understanding of how they should move about the garden. If this is your students' first time in the garden, refer to the Kindergarten "Garden Exploration" lesson for more details on how to establish group agreements for the garden. **(5 min.)**

2. Garden Bingo: Pass out a Fall Garden Bingo Worksheet to each student or pair of students. Explain that they'll explore the garden, crossing out squares when they discover them. Remind students how they can get a bingo (five horizontal, diagonal, or vertical squares in a row) and that they should call out bingo if they get it during exploration time. Whenever a student wins, you can invite them to take a bow while the class applauds. Explain that you'll play a couple of rounds before returning together as a class, and be sure they know the strategy you'll use to get their attention, such as a call-and-response song or whistle. After a couple students get bingo, move on to playing all-star bingo, where they must try to find every object on the bingo board and star each one they find. **(10 min.)**

3. Explain Rotations: Gather students back together. Pick two or three of the following activities for students to rotate through. Nature Bracelets or Life in a Square Foot can work as self-directed stations, whereas they will need guidance for Meet a Plant or Human Camera, so if you don't have other adult support, set up stations accordingly. Explain each rotation to students and the signal for when they should switch and how. **(5 min.)**

4. Demonstrate Safe Tool Use (if including Life in a Square Foot):

a. Demonstrate for students how to use magnifying glasses, demonstrating how to hold it up close to your eye, and then move the object you want to look at toward you until it comes into focus. Explain that magnifying glasses are delicate tools and that you are trusting students to use them responsibly.

b. Demonstrate for students how to use trowels to dig into the soil and look for insects and other critters safely, with the point aiming down, to avoid flinging soil upward toward their faces.

5. Rotations: (30 min. total, 10 min. for each rotation)

a. Nature Bracelets: Pass out a piece of painter's tape to each student, and have a neighbor help them secure it around their wrist with the sticky side facing out. Then let students know that they can go around collecting flowers and leaves to affix to their bracelet. Be sure to establish whatever parameters you'd like them to follow such as, *Only pick a leaf or flower if there are more than ten still left on the plant.*

b. Life in a Square Foot: Give a group of students a quadrat, and have them choose a location in the garden to place it down. Then they can use magnifying glasses and trowels to observe and record all the plants, weeds, and living creatures they see. Be sure to establish whatever parameters you'd like them to follow such as, *Only place the quadrat in an area outside the cultivated garden beds.*

c. Meet a Plant or Human Camera: (These activities are similar, so choose either i. or ii.)

i. Meet a Plant: Explain that, in this activity, students will get a chance to explore the garden using senses other

than sight. Encourage them to explore how else their brains can receive information about their surroundings. Split students into pairs, and have one partner close their eyes, while their guiding partner leads them to a tree or shrub. The partner keeps their eyes closed while they touch and smell the plant. The guiding partner can direct their hands to interesting parts of the plant to explore. Then the guiding partner leads them back to the starting place, and the partner must find the tree they met. *OR*

ii. Human Camera: In this activity, one person in the pair becomes a “camera” by closing their eyes. The guiding partner, the “photographer,” brings their partner, the “camera,” to a beautiful plant or view in the garden. Once there, the photographer positions the human camera as they’d like, perhaps guiding their chin up or down and has them open their eyes, like a shutter, to take a mental snapshot of what they see. The human camera should quickly close their eyes again, and the photographer can have them take a couple more pictures in different spots before they switch roles. You can have them then open their eyes and try to find the spots where they took pictures. (Joseph Cornell, author of *Sharing Nature with Children*, developed this activity)

6. Closing: Gather students back together in a circle. Practice using a gathering song or call-and-response that students will always sing when it’s time to come together again as a class. Then discuss the reflection questions.

REFLECTION

Have students discuss the following questions in small groups, then share with the class: (5 min.)

- *What was the most interesting thing you discovered in the garden today?*
- *Which senses did you use while exploring the garden today?*
- *How do you think this part of the garden will change over the season?*
- *What are you looking forward to learning about in the garden?*
- *Ask yourself: Was I safe and respectful in the garden today?*

ADAPTATIONS

Preselecting a Spot for Life in a Square Foot:

If your garden is small, or you’re unsure about letting students choose spots to dig up, you can instead preselect a location for Life in a Square Foot. In this case, turn the soil in an unplanted portion of a garden bed to unearth worms and other creatures. (If you have time to plan a few days in advance, you can cover this space with burlap or mulch.) Measure a square foot, and define the space with string and/or stakes before the lesson begins.

Extension: Have students create garden journals in which they’ll record all their observations, reflections, drawings, and measurements while in the garden. See Orientation Session in the *Sprouts Scouts Leaders Handbook* for more detailed instructions.

Language: Have students create plant tags and other signage in their home language and place the tags throughout the garden to identify

various plants and garden features. You can use plant labels, popsicle sticks, or wooden signs painted with blackboard paint, which allow students to update the signs seasonally as you rotate your crops.

ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.SL.4.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 4 topics and texts*, building on others' ideas and expressing their own clearly.

Next Generation Science Standards


NGSS 4-LS1-2

Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.

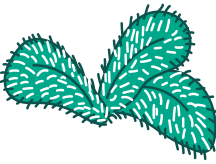

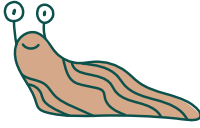



GETTING TO KNOW THE GARDEN BINGO

 <p>A home for an animal</p>	 <p>Garden pest</p>	 <p>Spider or spider web</p>	 <p>Leaf you like to eat</p>	 <p>Plant</p>
 <p>Flower pollen</p>	 <p>A plant with thorns or spines</p>	 <p>A flower with bright colors</p>	 <p>Evidence of a mammal</p>	 <p>A plant with fuzzy leaves</p>
 <p>Fruit</p>	 <p>A weed</p>	<p>FREE</p>	 <p>Roly-poly</p>	 <p>Something that sparkles in the sun</p>
 <p>Flower you can eat</p>	 <p>Decomposing plant</p>	 <p>Dead leaf a plant dropped</p>	 <p>Seed pod</p>	 <p>Worm</p>
 <p>Vegetable that grows underground</p>	 <p>An insect that flies</p>	 <p>Compost pile</p>	 <p>A bird</p>	 <p>Water spigot</p>

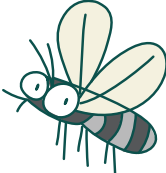
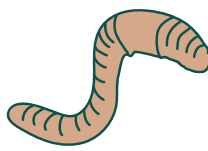









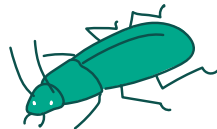




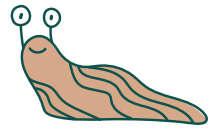



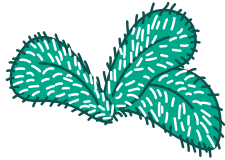
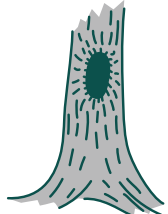
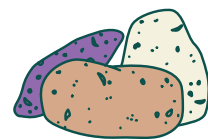

GETTING TO KNOW THE GARDEN BINGO

 Seed pod	 Roly-poly	 Decomposing plant	 A bird	 Flower pollen
 Vegetable that grows underground	 Water spigot	 Dead leaf a plant dropped	 Fruit	 Worm
 Plant	 A home for an animal	FREE	 Spider or spider web	 Flower you can eat
 An insect that flies	 A plant with fuzzy leaves	 Something that sparkles in the sun	 A flower with bright colors	 An insect that crawls
 A plant with thorns or spines	 Evidence of a mammal	 Garden pest	 Leaf you like to eat	 Compost pile

GETTING TO KNOW THE GARDEN BINGO

 <p>A weed</p>	 <p>Vegetable that grows underground</p>	 <p>Seed pod</p>	 <p>Plant</p>	 <p>A plant with fuzzy leaves</p>
 <p>Something that sparkles in the sun</p>	 <p>Dead leaf a plant dropped</p>	 <p>A home for an animal</p>	 <p>Garden pest</p>	 <p>Worm</p>
 <p>Leaf you like to eat</p>	 <p>Roly-poly</p>	<p>FREE</p>	 <p>Evidence of a mammal</p>	 <p>An insect that crawls</p>
 <p>Compost pile</p>	 <p>Water spigot</p>	 <p>Flower pollen</p>	 <p>A flower with bright colors</p>	 <p>An insect that flies</p>
 <p>Fruit</p>	 <p>Flower you can eat</p>	 <p>Spider or spider web</p>	 <p>Decomposing plant</p>	 <p>A bird</p>

GETTING TO KNOW THE GARDEN BINGO

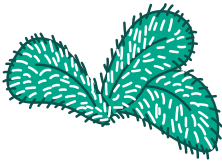

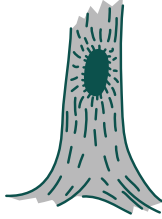








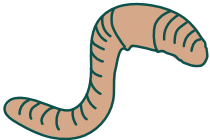




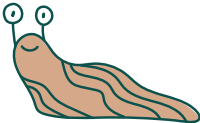

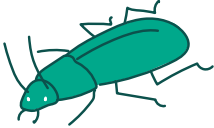


 <p>An insect that flies</p>	 <p>Worm</p>	 <p>Fruit</p>	 <p>Evidence of a mammal</p>	 <p>Roly-poly</p>
 <p>A bird</p>	 <p>Compost pile</p>	 <p>Flower pollen</p>	 <p>Water spigot</p>	 <p>A flower with bright colors</p>
 <p>Flower you can eat</p>	 <p>An insect that crawls</p>	<p>FREE</p>	 <p>Seed pod</p>	 <p>A plant with thorns or spines</p>
 <p>Leaf you like to eat</p>	 <p>A weed</p>	 <p>Garden pest</p>	 <p>Plant</p>	 <p>Dead leaf a plant dropped</p>
 <p>Decomposing plant</p>	 <p>A plant with fuzzy leaves</p>	 <p>A home for an animal</p>	 <p>Vegetable that grows underground</p>	 <p>Spider or spider web</p>

GETTING TO KNOW THE GARDEN




BINGO

 <p>Evidence of a mammal</p>	 <p>Spider or spider web</p>	 <p>A flower with bright colors</p>	 <p>An insect that crawls</p>	 <p>Garden pest</p>
 <p>A plant with thorns or spines</p>	 <p>Fruit</p>	 <p>A bird</p>	 <p>Roly-poly</p>	 <p>An insect that flies</p>
 <p>A home for an animal</p>	 <p>A plant with fuzzy leaves</p>	<p>FREE</p>	 <p>Decomposing plant</p>	 <p>Vegetable that grows underground</p>
 <p>Water spigot</p>	 <p>Worm</p>	 <p>Flower you can eat</p>	 <p>Flower pollen</p>	 <p>Leaf you like to eat</p>
 <p>Dead leaf a plant dropped</p>	 <p>Something that sparkles in the sun</p>	 <p>Seed pod</p>	 <p>A weed</p>	 <p>Plant</p>

GETTING TO KNOW THE GARDEN BINGO

 <p>A plant with fuzzy leaves</p>	 <p>Flower you can eat</p>	 <p>A home for an animal</p>	 <p>Compost pile</p>	 <p>Dead leaf a plant dropped</p>
 <p>Water spigot</p>	 <p>A plant with thorns or spines</p>	 <p>A weed</p>	 <p>Leaf you like to eat</p>	 <p>Something that sparkles in the sun</p>
 <p>A flower with bright colors</p>	 <p>An insect that flies</p>	<p>FREE</p>	 <p>A bird</p>	 <p>Worm</p>
 <p>Spider or spider web</p>	 <p>Seed pod</p>	 <p>Roly-poly</p>	 <p>Vegetable that grows underground</p>	 <p>Plant</p>
 <p>Garden pest</p>	 <p>Evidence of a mammal</p>	 <p>An insect that crawls</p>	 <p>Fruit</p>	 <p>Decomposing plant</p>

GETTING TO KNOW THE GARDEN BINGO

 <p>Water spigot</p>	 <p>Vegetable that grows underground</p>	 <p>A flower with bright colors</p>	 <p>Evidence of a mammal</p>	 <p>An insect that crawls</p>
 <p>Worm</p>	 <p>Flower pollen</p>	 <p>Roly-poly</p>	 <p>A weed</p>	 <p>Spider or spider web</p>
 <p>A plant with thorns or spines</p>	 <p>Seed pod</p>	<p>FREE</p>	 <p>Garden pest</p>	 <p>Decomposing plant</p>
 <p>Dead leaf a plant dropped</p>	 <p>Something that sparkles in the sun</p>	 <p>Fruit</p>	 <p>A bird</p>	 <p>A plant with fuzzy leaves</p>
 <p>Leaf you like to eat</p>	 <p>Compost pile</p>	 <p>Plant</p>	 <p>An insect that flies</p>	 <p>A home for an animal</p>

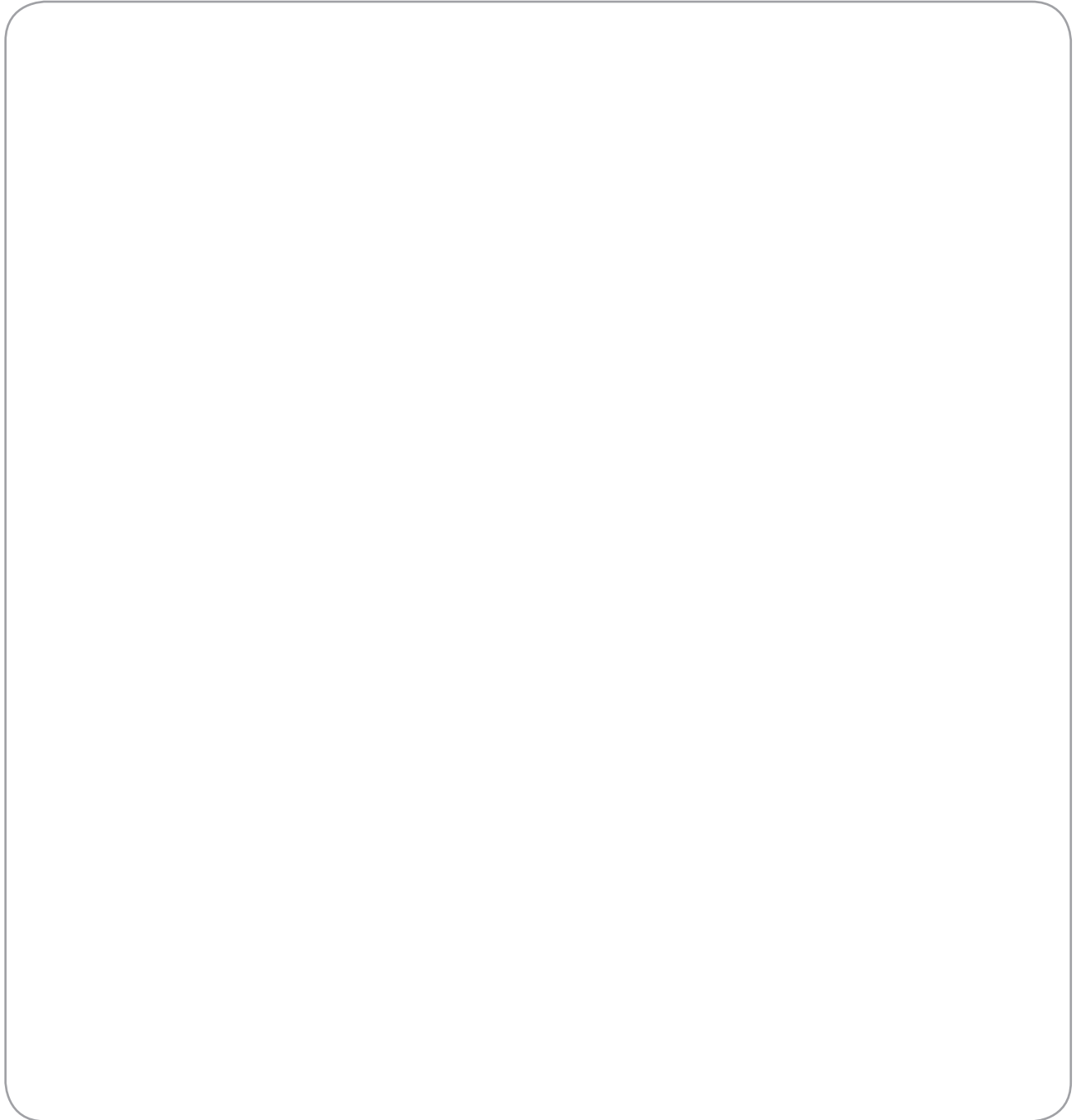
GETTING TO KNOW THE GARDEN BINGO

 <p>Decomposing plant</p>	 <p>An insect that crawls</p>	 <p>Vegetable that grows underground</p>	 <p>Worm</p>	 <p>Flower you can eat</p>
 <p>Evidence of a mammal</p>	 <p>Something that sparkles in the sun</p>	 <p>An insect that flies</p>	 <p>Dead leaf a plant dropped</p>	 <p>Compost pile</p>
 <p>Garden pest</p>	 <p>Plant</p>	<p>FREE</p>	 <p>Leaf you like to eat</p>	 <p>Fruit</p>
 <p>A flower with bright colors</p>	 <p>Flower pollen</p>	 <p>A weed</p>	 <p>Roly-poly</p>	 <p>Spider or spider web</p>
 <p>Seed pod</p>	 <p>A bird</p>	 <p>A plant with fuzzy leaves</p>	 <p>A plant with thorns or spines</p>	 <p>Water spigot</p>

Name: _____ Date: _____

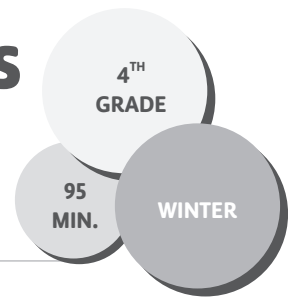
Life in a Square Foot

Directions: Draw all the living things you see in the square, including insects and plants. Be as detailed as possible.



Becoming Cafeteria Mentors

THEME: MAKING HEALTHY FOOD CHOICES



Session 1: 65-min. planning period

Session 2: 30-min. final run-throughs and presentations to kindergarten and first grade classes

ESSENTIAL QUESTIONS

How can we create an engaging presentation to teach younger students about making healthy choices?

LEARNING OBJECTIVES

✓ Students will be able to identify and communicate to younger students how to navigate the salad bar to build a balanced meal in the school cafeteria.

✓ Students will be able to identify and communicate to younger students how to be kind and thoughtful in the school cafeteria.

LESSON DESCRIPTION

In this lesson, students will consider the best ways to navigate the cafeteria salad bar. Then, in groups, they'll brainstorm engaging ways to present this information to younger students with whom they'll establish mentor relationships.

MATERIALS

- Plates, cafeteria trays
- 10 copies of Salad Bar Sorting Cards (p. 359)
- Bowls or containers to categorize sorting cards
- Peer Presentation Rubric (p. 360)
- Chart paper
- Markers
- USDA/FNS "Salad Bar Etiquette" handout (find online)

PREPARATION

- › Coordinate with kindergarten and/or first grade classroom teachers to determine a date and time that a group of fourth graders can come to teach about the salad bar. Plan the number of students in each group depending on how many classrooms you plan to visit.
- › Set up a meeting with a member of the food service staff ahead of time to learn about typical lunch-time offerings and serving styles; discuss this lesson with them; ask what they would like your students to emphasize when teaching kindergarteners and first graders about navigating the salad bar; and find out how else your class might be helpful, such as by creating visual aids for the cafeteria.
- › Photocopy the Salad Bar Sorting Cards.
- › In your classroom, arrange desks, or set up two long tables on opposite sides of the classroom to act as imaginary salad bars or lunch lines. Do your best to mimic the actual setup of your school salad bar (single line, two-sided line, etc.). You might see if you can borrow cafeteria trays for students to use during the simulation. Place a stack of these or plates at the end of the table where students will start. Place ingredient cards in different containers to act as salad bar or meal line components. Pick ingredients you know your cafeteria regularly has.

ACTION STEPS

1. Simulated Cafeteria Salad Bar: Gather students in a circle and explain, *Today we're going to be thinking about the choices we make at the cafeteria salad bar.* Point out the pretend salad bars on either side of the classroom, and explain that they'll go through and take different cards to create a pretend lunch salad. Ask them to tell you what behavior expectations are when approaching the salad bar, and have them model these same behaviors (keeping your place in line, quiet voices, etc.). Then split the class in two, and have students form a line to go through the pretend salad bar to build a salad. **(10 min.)**

2. Finding What's on our Plate: Have students return to the circle with their salad bar selections, and go through the different components. It might look like the following: *Give a thumbs up if you have more than five things on your plate. Give a thumbs up if you have more than three colors on your plate. More than four colors? Every color of the rainbow? The more diversity in our diet, the better because that way we're getting the different vitamins and minerals our bodies need. Thumbs up if you have protein on your plate like an egg, beans, or cheese. Protein helps build our muscles and maintain our organs. Thumbs up if you have something you've never tried before. Often we assume we won't like something, but if we're open to trying new things again and again, we discover new healthy food that we actually like to eat.* Ask students whether, considering the different things you've discussed—diversity, eating the rainbow, incorporating protein, and trying new things—there's anything more they'd add to their plates. **(5 min.)**

3. Explain the Project: Tell students that they're going to teach younger students how to make healthy choices at the cafeteria salad bar. Ask students to turn and talk to a neighbor about what kindergarteners and first graders should learn about going through the salad bar or lunch line and about being in the cafeteria in general. Have partners share. Record responses on chart paper or on the board, creating a list together as a class. You might ask students, *What does it look like to be polite in the lunch line?* Show students the Salad Bar Etiquette handout from the USDA, and add anything they may have missed to your list. *What does it look like to be kind and thoughtful at the lunch table? What does it look like to be inclusive at lunch time?* **(10 min.)**

SAMPLE TOPICS

- Making Choices at the Salad Bar
 - Diversity/eating the rainbow
 - Picking protein
 - Trying new things
- Line Etiquette
 - Use utensils, not your hands
 - Cover your mouth with the inside of your elbow if you need to cough or sneeze
 - Take turns and keep bodies safe
- At the Table
 - Be kind
 - Be inclusive

4. Creating Presentations: Tell students that their challenge is to think of fun ways to share this information with students in a presentation that should be no longer than ten minutes. Say, *You can create a skit, a song, a game, or a presentation with a poster as long as it communicates the information we discussed.* Assign groups of four to five students, and have them work to create their presentation. Explain that they'll have to be ready to give their

presentation to their peers. Say, *Your peers will be evaluating your presentation on four factors: that you project your voices and speak clearly, that you include three specific pieces of new information* (these might be about healthy choices at the salad bar, being polite, specific things the food service staff asked you to highlight, etc.), *that you make it fun, and that you make it easy to understand.* **(20 min.)**

5. Practicing in Groups: Pass out a Peer Rubric to each group. Match groups to give presentations to each other and provide feedback. **(15 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *Why is it important to try new things? Why is important to have diversity on your plate? Why is protein important to eat?*
- *What are the important things to keep in mind when you're presenting to the younger kids?*

ADAPTATIONS

Extension: Have students make food safety posters and other signage for the salad bar that cafeteria staff have deemed would be most helpful.

Follow-Up: Coordinate with kindergarten and first grade teachers to assign fourth graders to be lunch buddies to their classes. Fourth graders can go through the lunch line with their younger peers, guiding them through the salad bar and eating together.

ACADEMIC CONNECTIONS

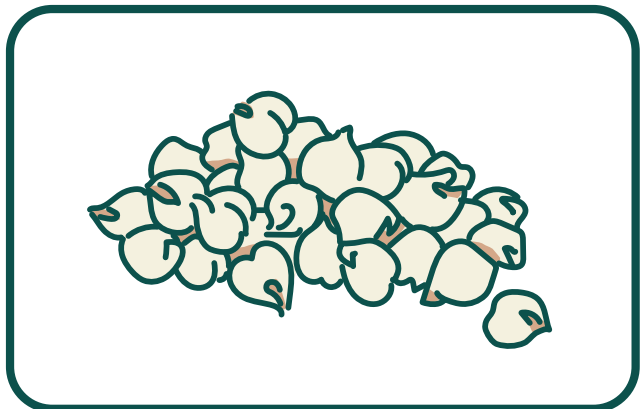
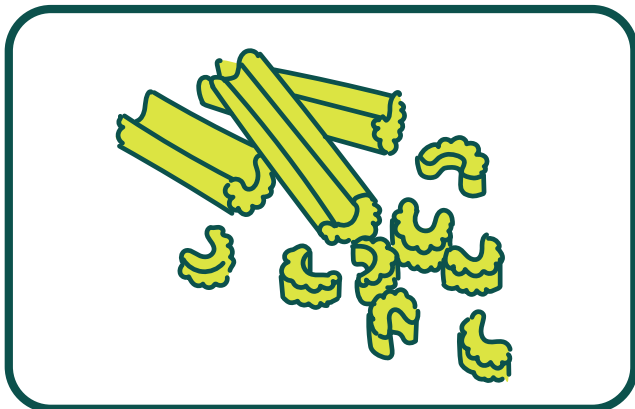
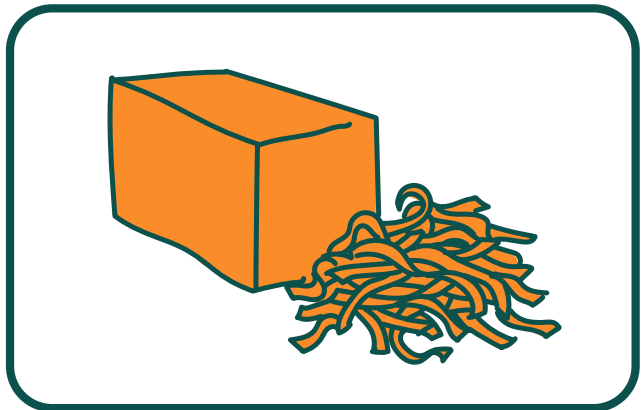
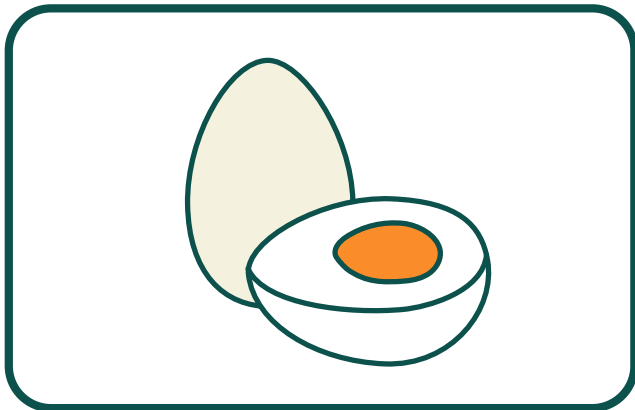
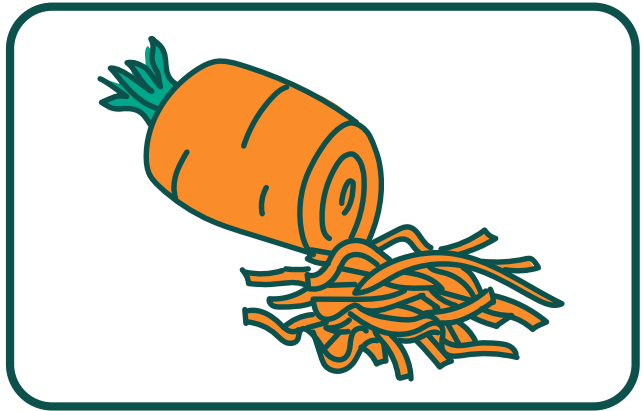
English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.SL.4.4

Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.



Salad Bar Sorting Cards



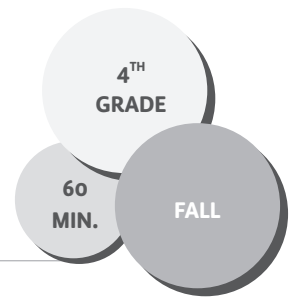
Peer Presentation Rubric

Peer Presentation: One of the best ways to improve a skill is by receiving specific feedback. To help improve our presentations, we'll be giving feedback to one another. When another student is presenting, use this form to write specific examples of things they say or do that worked well for you and things that you think could be improved. Be as specific as possible.

PEER PRESENTATION RUBRIC		
Did They . . . ?	Example of Excellence	Opportunity to Improve
<i>Example: Speak clearly and loudly.</i>	<i>Example: When you explained how to choose a protein, I heard every word clearly.</i>	<i>Example: When you were talking about eating a range of colors, you turned your back to us to look at your poster, and I wasn't able to hear what you were saying.</i>
Speak clearly and loudly.		
Provide all the information.		
Make it easy to understand.		
Make it fun.		

The World Travels of Food

THEME: EXPLORING THE ECOLOGY OF FOOD



ESSENTIAL QUESTION

How does what we eat influence the environment?

Where does our food come from?

LEARNING OBJECTIVES

✓ Students will be able to calculate food miles for various apple ingredients.

✓ Students will be able to create a scaled representation of the distance food travels.

LESSON DESCRIPTION

In this lesson, students explore the concept of food miles through reading a book about a journey around the world to source ingredients. They then calculate a scaled representation of the food miles for the various ingredients and create a human graph to compare mileage.

MATERIALS

- Local fruit to have as a snack (optional)
- *How to Make an Apple Pie and See the World* by Marjorie Priceman
- Calculators (optional)
- 5–6 balls of yarn or string
- 5–6 pairs of scissors
- Measuring sticks
- Half-sheet copy of the Food Miles Chart for each student (p. 364)

PREPARATION

- › Prepare local fruit for tasting, if using
- › Photocopy and print out the Food Miles Chart from *How to Make an Apple Pie and See the World*.

ACTION STEPS

1. Engage: Ask, *What is your favorite fruit to have as a snack?* Take answers, and follow up by asking if students know where those fruits are grown. Introduce the concept of food miles. Explain, *The United States gets most of its bananas from Latin America. That means that when you eat a banana, it's traveled thousands of miles to get to you.* (Of course, you should modify this example to make sense for your region, especially if you live in Hawaii!) Ask students if they know of fruits that are grown in their town or region. Pass out a snack of a local fruit, and share with students where you got it. **(5 min.)**

2. Reading: Explain that you're going to read a book called *How to Make an Apple Pie and See the World*. During the read-aloud, have students make a list of the places the main character visited to gather ingredients. **(10 min.)**

3. Discussing: Ask students what they thought of the main character's journey. Ask, *What was realistic about it?* Discuss how it's true that we

get a lot of our food from around the world, but that it's usually shipped to grocery stores. Ask, *What ingredients do you think she traveled too far to get?* Discuss how perhaps the eggs, butter, and wheat could have come from a local farm. **(5 min.)**

4. Calculating Food Miles: Provide students with the Food Miles Chart with the distance in miles for each ingredient in the apple pie. Tell them you're going to use a scale to make a representation of how far the ingredients would have traveled. **(10 min.)**

5. Measuring Feet: Put students in groups, and assign each group one ingredient. Explain that they'll need to divide their number of miles by 100 to figure out how many feet long to make their string. Provide string, scissors, and measuring sticks, and have them measure a length of string to represent the food mileage of their ingredient. **(10 min.)**

6. Field Graph: Walk students to the school's field, blacktop, or gymnasium. Explain to students that they'll be making a human bar graph to compare the distances each ingredient had traveled. Have each group stretch out their yarn from the same starting point. Have group members take turns holding the string and walking around to see the other group's mileage. **(15–20 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *How did seeing the field graph affect your thinking about food miles?*

- *Why do we have to purchase certain food staples from other countries?*
- *Why should we care where our food comes from? What impact do food miles have on the environment?*
- *What were successes and good strategies for working in your groups? What can you continue to work on?*

ADAPTATIONS

Technology: If your students have access to computers, you can have them research and calculate the food miles of each ingredient in a typical school lunch, using the website www.foodmiles.com. In addition, you can have them research local farms, finding local alternatives.

Physical: Set up three different obstacle courses on the field, ranging in length. Have each obstacle course represent a fruit. For example, the short course could represent an apple or other fruit grown locally, the medium course would represent an orange grown in the United States, and the long course could represent a banana grown in South America. This would vary, depending on your location.

ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.RL.5.7

Analyze how visual and multimedia elements contribute to the meaning, tone, or beauty of a text (e.g., graphic novel, multimedia presentation of fiction, folktale, myth, poem).

Next Generation Science Standards, Life Science Disciplinary Core Idea

NGSS ESS.3.C

Human Impacts on Earth Systems – Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth’s resources and environments.

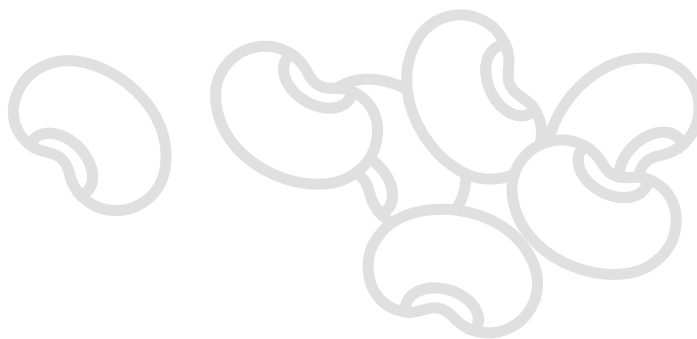
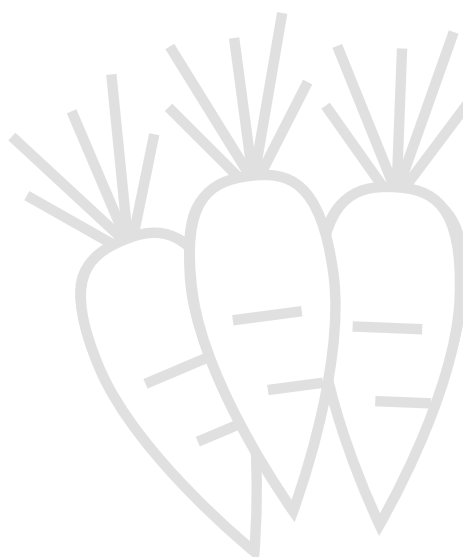
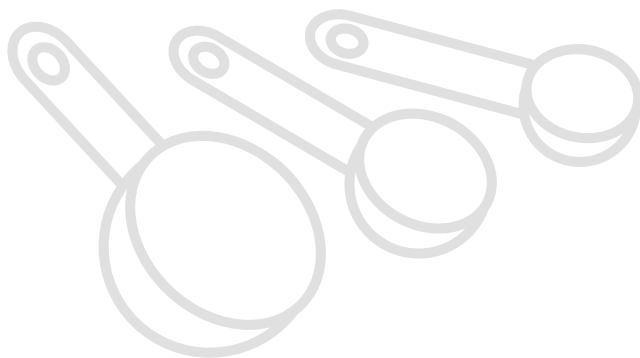
Math Common Core State Standards

CCSS.MATH.CONTENT.5.NBT.A.1

Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.

CCSS.MATH.CONTENT.5.NBT.A.2

Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.



Food Miles Charts

Name: _____ Date: _____

FOOD MILES FROM *HOW TO MAKE AN APPLE PIE AND SEE THE WORLD*

Ingredient	Location	Miles	Scale 1 foot equals 100 miles (round to the nearest foot)	Local Alternative?
Wheat	Italy	4,484		
Chicken eggs	France	3,831		
Cinnamon	Sri Lanka	8,941		
Butter from cow's milk	England	3,666		
Sugar	Jamaica	1,444		
Apples	Vermont			

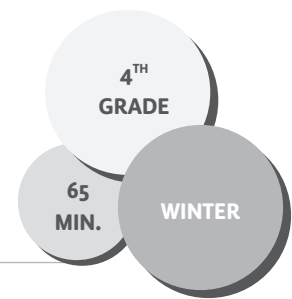
Name: _____ Date: _____

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Chicken eggs	France	3,831		
Cinnamon	Sri Lanka	8,941		
Butter from cow's milk	England	3,666		
Sugar	Jamaica	1,444		
Apples	Vermont			

A Patchwork Garden Quilt

THEME: GROWING AND ACCESSING HEALTHY FOOD



ESSENTIAL QUESTION

How can we effectively plan a garden?

LEARNING OBJECTIVES

- ✓ Students will be able to interpret a seed spacing guide to create a garden bed design.
- ✓ Students will be able to measure and apply a scale to create a garden bed design.

LESSON DESCRIPTION

In this lesson, students learn to read a seed spacing guide and learn how to design a 5' x 5' imaginary garden bed using chart paper. Students then combine the individual squares into a paper “quilt” made to look like a garden!

MATERIALS

- Piece of graph paper for each student
- Rulers
- Pencils
- Markers
- Glue
- Large piece of butcher paper
- Seed spacing guide (see High Mowing Seeds Planting Chart online)
- Seed catalogs for inspiration
- Dry erase marker and whiteboard for each student (optional)

PREPARATION

- › If your classroom doesn't have a document camera for you to display your graph paper, prepare a square grid on the blackboard.

ACTION STEPS

1. Introduction: Explain to students that today they're going to create their own imaginary garden bed with some of their favorite fruits and vegetables. Have students sit in a circle. Say, *Now take two scoots in closer to the circle, so we're all really close together.* Then ask students to lift their arms and stretch out. Ask, *Are you able to stretch as much as you'd like? Why not?* Now ask them to take three scoots back and try again. Ask if that feels better. Say, *Plants are just like us. They can't grow as big and healthy and happy as they'd like to if they don't have enough space away from their neighbors. This includes plants we didn't plant, which is why we weed, which means to remove unwanted plants. (5 min.)*

2. Role Playing: Gather students in a circle. Explain, *It's nice to have a diversity of plants in our garden. And like people, plants come in all different shapes and sizes and have different needs. So not all plants need the same amount of room.* Have students stand up turn the circle into a square. Say, *Let's pretend the space in the middle is one foot in a garden box. How many inches are in a foot? If I have to space lettuce every three inches, how many lettuce plants can*

I fit in my foot? Have students calculate using whiteboards, if you have them. Ask for four volunteers to be lettuce plants and one to be a gardener. Have the gardener evenly space the four lettuce plants across the carpet. Then ask, *What if my garden box were three feet? How many more lettuce plants could I add?* Have students do the math, and have the gardener add more “lettuce plants.” Then say, *I want to add tomatoes in the next row of my garden. Do you think I can add as many tomato plants as lettuce plants?* Discuss the answer. Then tell students that a tomato plant needs at least one or two feet of space. Ask, *So how many tomato plants can we fit?* Have the gardener plant one tomato plant, and have the student pretending to be a tomato stretch out his or her arms to show the space taken up. You may want to point out that the tomato could shade the lettuce, which would be a problem with other plant varieties that are sun-loving, but that it’s actually helpful for lettuce in hot weather. Have students orally summarize that in a 3’ x 3’ bed they planted one row of twelve lettuce plants and one row with just one tomato plant. Explain to students that farmers need to do this same kind of planning to get our food to us. **(10 min.)**

3. Reading Seed Charts: Have students return to their desks, and show them a seed spacing guide. Read one or two examples as a class, and check for understanding by asking comprehension questions. **(5 min.)**

4. Modeling the Activity: Explain to students that they’re going to use the seed spacing guide to plan their own, imaginary 3’ x 3’ garden bed. Using a document camera or a graph on the board, draw your own 3’ x 3’ bed, with each graph square representing a 4-inch square and each 9-square cube representing one square foot. Model adding

plants by illustrating them in the graph at the appropriate scale, using the seed spacing guide and the scale. Give students guidelines that ensure they’ll put adequate thought into their square. Encourage thinking about plant diversity and variety, such as, *Incorporate at least three different colors of plants into your plan.* **(10 min.)**

5. Making Personal Garden Beds: Have student helpers pass out graph paper and materials. Circulate through the room, providing guidance to students who need it and asking probing questions. **(20 min.)**

6. Sharing: Have students clean up their spaces and bring their square to the circle. Have students lay them side-by-side, creating a large quilt of their garden beds. Then ask the reflection questions listed below. After class, glue the squares together on large butcher paper or a bulletin board to create a square quilt. **(10 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *Why is it important to think about seed spacing when planning a garden bed? What other considerations do you have when planning?*
- *How does planting more than one type of food in our garden affect us?*
- *What did you enjoy about creating your own garden bed? What was challenging?*
- *Our Garden Quilt represents our commonalities and also our diversity as a class. What are some things you see in common between different people’s beds? What are some differences? What are some benefits to having diverse plants in a garden?*

ADAPTATIONS

Extension: Share a companion planting chart with students, and ask them to consider plant “friends” and “foes” when making their plans. Incorporate more math practice by asking students to calculate the square footage in one garden plot and then the square footage in the total class garden. Bring in a compass, and mark the cardinal directions on your garden models. Then discuss planting tall plants on the north side of the beds so they don’t shade the other plants.

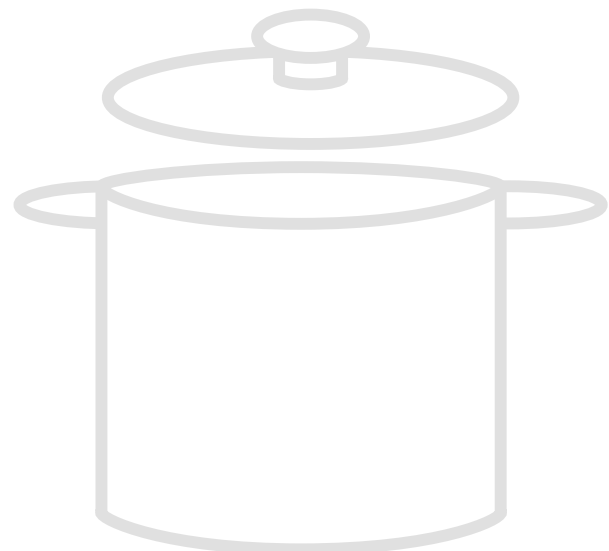
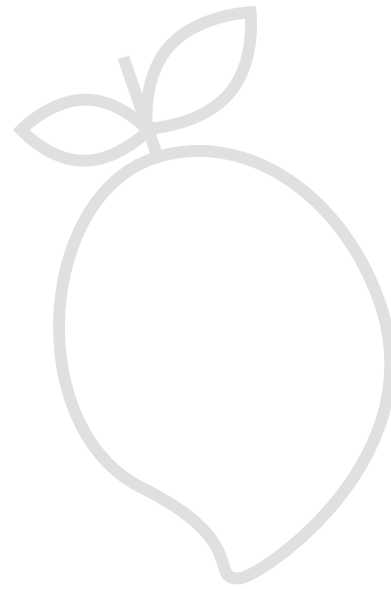
Garden Setting: If you have a garden space, have students work in teams to take measurements of your garden beds and make real plans for spring planting.

ACADEMIC CONNECTIONS

Math Common Core State Standards

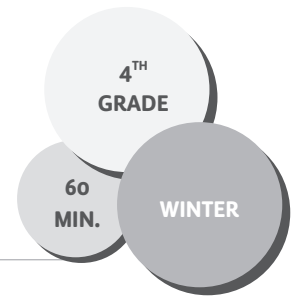
CCSS.MATH.CONTENT.4.MD.A.1

Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table.



Salad Dressing Challenge

THEME: PREPARING HEALTHY FOOD



ESSENTIAL QUESTION

How can we balance flavors in a dish?

LEARNING OBJECTIVES

- ✓ Students will be able to collaborate to prepare a salad dressing.
- ✓ Students will be able to develop their own salad dressing recipe.

LESSON DESCRIPTION

After learning the basic formula for a dressing, students will collaborate in groups to develop a custom salad dressing, and they will vote on a class favorite.

MATERIALS

■ A collection of a few dressing ingredients from the chart below; limit to just a few items, such as olive oil, 3 kinds of vinegars, salt, honey, mustard, and 2 spices or herbs

■ 5–6 bunches of greens (kale, lettuce, or whatever is available)

A set of the following for each group of 4–6 students:

- Zip lock bags for kale or large mixing bowls for lettuce
- Measuring spoons
- Small bowls
- Kitchen tongs
- 1 small jar with screw-top lid (½ pint)

For each student:

- Plate and fork
- Salad Dressing Recipe Cards (p. 371)

PREPARATION

- › Set up a station of ingredients at the front of the room where students will shop. Ideally, you'll have several options from each column in the chart, so groups will have distinct dressings. Choose what makes sense based on your comfort level, what's in season, and what you already have on hand.
- › Prepare a large bowl or zip lock bag of greens for each group as well as a small bowl for tasting.
- › Pour ½ cup (8 Tbsp) of olive oil or other fat into a mason jar for each group.
- › Display a chart of the list of ingredients you have on hand (on chart paper or on the board)
- › Photocopy and cut blank Salad Dressing Recipe Cards for each student.
- › Display the following Dressing Formula:
2 Fat + 1 Sour + Small Pinches of Flavorings = Dressing!

POSSIBLE INGREDIENTS

FAT	SOUR	SALTY	SWEET
Olive oil	Lemon/lime	Kosher salt	Honey
Sesame oil	Orange	Sea salt	Raisins
Yogurt	Rice vinegar	Fish sauce	Other dried fruit
Avocado	Apple cider vinegar	Soy sauce	Apple slices or other fresh fruit
Tahini	Balsamic vinegar		Sugar
	Mustard		

ACTION STEPS

1. Engage: Have ingredients on display, and ask students to share which ingredients they know and like. Lead a discussion about students' favorites. Have students figure out the four different categories of ingredients. Ask, *What do each of these groups of ingredients have in common?* Have students discuss and share ideas as a class. Explain that any good dressing or sauce has a balance of these things: richness, sourness, saltiness, and perhaps some sweetness. The key to making a good dressing is balancing these flavors based on what you like and tasting as you go. Direct students' attention to the Dressing Formula: 2 Fat + 1 Sour + Small Pinches of Flavorings = Dressing! Say, *If you had eight tablespoons of a fat, how many tablespoons of a sour ingredient should you add?* **(10 min.)**

2. Explain the Activity: Say, *In groups you'll be coming up with your own dressing recipe. You'll be given a fat to start with (eight tablespoons already in your mason jar); and then you'll have to come to a consensus about what your sour, salt, and sweet will be. Be open-minded and open to compromise. Once you've each created your own salad dressing, we'll have a chance to try each other's and vote on our favorite!* Remind students that a little goes a long way; and especially when it comes to adding salt or soy sauce, for example, they'll want to add in pinches or dashes at a time. Demonstrate and show what a pinch or a dash would be. Discuss ways of tweaking a dressing (e.g., ask, *If my dressing tastes too sour because I added too much vinegar, what can I add?*) Discuss adding more of the fat or sweet ingredients. **(5 min.)**

3. Wash Hands Break! (5 min.)

4. Negotiating a Dressing Recipe: Break students into groups of no more than five, and give them their group jar and a small bowl of leaves for tasting. You may want to assign a group leader who can give roles to each group member, such as recipe recorder, timekeeper, spokesperson, taste tester, etc. Have students negotiate and decide on their formula. Once each group has come to a consensus, have a group representative come to shop for ingredients with you at the ingredient station. **(10 min.)**

5. Making Dressing: Back at their tables, have groups add ingredients, shake their jars, and take a small leaf and dip it into the dressing. Remind them not to put a partially eaten leaf back into the jar. Ask how they can work together to improve the recipe. Say, *Talk with your group about what you can taste the most of and what you might need more of.* Give them time to adjust their recipes. **(5 min.)**

6. Dressing Salad: Once each group is satisfied with their dressing, pass out bowls of greens. If you're making a massaged kale salad, pass out zip lock bags of kale for students to pour dressing directly into and then massage the leaves through the bag. **(10 min.)**

7. Tasting and Voting: Have groups bring up bowls of tossed salad to the front of the room. Then have students use tongs to take just a taste of each salad on their plates, buffet-style. Alternatively, have one representative from each group circulate through the room and serve students a taste. Taste together and encourage students to use descriptive words to describe the flavors. You could also invite them to share

a “pro” (something they like about the dressing) and a “grow” (a suggestion for improvement). Students might enjoy having their classroom teacher or another staff member decide on the best dressing in addition to a class vote. **(10 min.)**

8. Recipe: Have each student write his or her ideal dressing recipe to take home. **(5 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- Which dressing was your favorite?
- What ingredients surprised you?
- How did tasting other groups' dressings change your mind about your own dressing?
- How could you make this dressing at home?
- How did it feel to negotiate in your groups?
- How did your groups determine what would go in your dressing?
- How did your ability to collaborate affect the taste of your dressing?

ADAPTATIONS

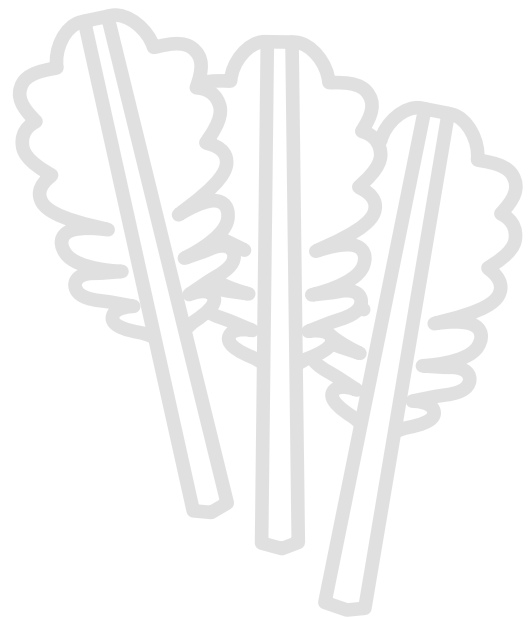
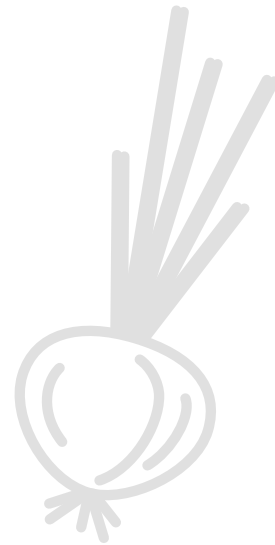
Garden Setting: Have students harvest their own greens and fresh herbs to add to their dressing.

ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.SL.4.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 4 topics and texts*, building on others' ideas and expressing their own clearly.



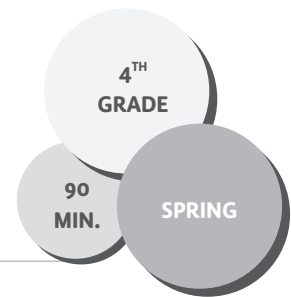
Salad Dressing Recipe Cards

FAT _____	SOUR _____	DIRECTIONS _____
SALTY _____	SWEET _____	

FAT _____	SOUR _____	DIRECTIONS _____
SALTY _____	SWEET _____	

Learning from Our Elders

THEME: MAKING HEALTHY FOOD CHOICES



Session 1: 45-min. planning period

Session 2: 45-min. session with guests

ESSENTIAL QUESTION

What can we learn from our elders about food traditions and healthy eating?

LEARNING OBJECTIVES

- ✓ Students will be able to articulate how one person's food preferences, experiences, and traditions have changed over time.
- ✓ Students will be able to compose thoughtful questions and conduct an interview with an elder in their community.

LESSON DESCRIPTION

In this lesson, students consider the elders in their families and communities and determine what they'd like to learn from them around the themes of food and healthy eating. Students learn about effective interviewing, generate a list of questions, and interview an elder they know. During the next class meeting, students share what they learned and have elder community members share their stories, wisdom, and recipes with the class.

MATERIALS

- Nice paper
- Crayons, markers, or colored pencils
- Guest Interest Form Template (p. 376)
- Learning from Our Elders Worksheet (p. 377)
- Cooking and tasting supplies (if guest plans to demonstrate a traditional skill or dish)

PREPARATION

- › If some of your students don't have anyone in their immediate network to interview, make a list of adults in the community who they could interview. This list could include members of the school staff, volunteers, or others. Ask these people in advance if they would be open to being interviewed by students about cooking, eating, and healthy living.
- › Reach out to a local storyteller or elder from whom you'd like your students to learn; schedule a class visit with this individual.
- › Photocopy Learning from Our Elders Worksheet for each student.

ACTION STEPS

- 1. Who Our Elders Are:** Explain why elders have so much to teach us about cooking, eating, and healthy living. *Our food supply has changed a lot in recent years. Elders have seen this change. Many elders have thought a lot about what they want to eat to be able to stay healthy. You can learn a lot from elders by interviewing them.* Ask students to brainstorm with a partner what makes someone an elder. Have students share as a class, identifying attributes such as being older than you or having wisdom or life experience to share. Ask students, *Who are the elders in your life? Who in your life do you feel you have something to learn from?* Have each student make a list of these people. **(5 min.)**

2. Brainstorming Questions: Say, *With these people in mind, what do you want to learn about them related to cooking, eating, and healthy living?* Have students generate a list as a class of things they'd like to know. **(5 min.)**

SAMPLE INTERVIEW QUESTIONS

- What did you eat growing up?
- What's a food you used to not like that you like now?
- What does healthy eating mean to you?
- When you were a kid, what did you eat at school?
- What did you eat with your family?
- What traditional meals from your culture were you taught to make?
- Do you have ways of preserving food?
- What's your favorite tool in the kitchen?
- What's your favorite recipe?
- What's a food or meal from your childhood that you recommend I try? Why?
- What's your all-time favorite food memory?
- When you were a kid, what did you eat on special occasions?
- Is there a recipe or traditional cooking method that you'd enjoy sharing with my class?

3. Learning What Makes a Good Interview: Tell students, *You will each be interviewing an elder. To gather as much information as possible, it's important to keep a few guidelines in mind.* Explain that while some yes or no questions are OK, open-ended questions encourage people to give details and tell more stories. Explain how it's always good to have follow-up questions prepared for yes or no questions but to also be flexible in the moment and think of follow-up questions to ask on the spot. Give students an example of a yes or no question, and ask them

to revise it into an open-ended question. For example, "Did you have school lunch when you were a kid?" can become, "Describe what you ate for lunch when you were a kid." Have students write their own list of interview questions. Ask students, *What are ways that we can show respect and communicate that we're actively listening?* Discuss making eye contact, nodding their heads, and expressing genuine interest through their responses. **(10 min.)**

WHAT MAKES A GOOD INTERVIEW?

- Asking open-ended questions
- Asking follow-up questions
- Being flexible
- Respecting someone's privacy
- Showing genuine interest
- Recording/writing important points

4. Practicing Interviewing: Demonstrate holding a practice interview with a volunteer student or with the classroom teacher. Model positive interview techniques by asking open-ended questions, making eye contact, and expressing genuine interest through responses. Have students give you feedback on what you did well and what you could have done to improve your interview. Then have students pair up and practice interviewing one other, keeping the good interview guidelines in mind. Circulate through the room, listening to students' exchanges and encouraging active listening where needed. After about seven minutes, have students switch so that each partner has a chance to be interviewed. Have partners provide each other with feedback on how they can be better listeners or how they can revise their questions to get more interesting responses. **(20 min.)**

5. At Home: Explain that students should somehow capture their discussion, whether by taking notes during the conversation, summarizing it afterward, or recording the conversation on a device with the interviewee's permission. Let students know the date that you'd like to invite guests in to share stories, and tell them to be sure to ask their interviewee whether they'd like to be a part of the event. Pass out the Guest Interest Form Template for students to share at home. **(5 min.)**

6. (Next Meeting) Follow-Up Sharing: Give students time to write a personal reflection or share what they learned from the elder they interviewed with a partner. Then gather as a class to do a round robin where each student shares one interesting thing they learned. Tell students they'll have a time limit of 30 seconds. **(20 min.)**

7. Inviting Guests to Class:

a. Facilitate a conversation where each student has a couple prepared questions to ask the guests. Students take turns asking a question and having all the guests who'd like to share a story or response. If you have three or more guests, set up this activity so that students are rotating among speakers in small groups. Have students use the Learning from Our Elders Worksheet to record interesting facts and questions about the guests.

b. Have guests bring in a traditional cooking tool and demonstrate how to use it.

c. Have guests bring in their favorite recipes and share memories of that food. Then compile a class cookbook of all the recipes.

d. Ask elders to demonstrate traditional

food cooking skills to the class. (Be prepared to provide support and supplies if needed. Depending on the level of involvement of the cooking project, this may need to be scheduled as a separate activity)

8. Writing Thank-You Notes: After guests of honor visit the class, have students write them letters of gratitude. Have students use their Learning from Our Elders Worksheet to remember to share personal details about what they enjoyed learning. **(10 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *What was the most interesting thing you learned from your interview?*
- *How did what you learned from our guests compare with what you learned during your first conversation with an elder?*
- *How is your life similar to and different from the life of our elders when they were your age?*
- *How has the idea of healthy eating changed over the years?*
- *What are some things you do now that you think might be interesting to kids 50 years from now, when you are an elder?*

ADAPTATIONS

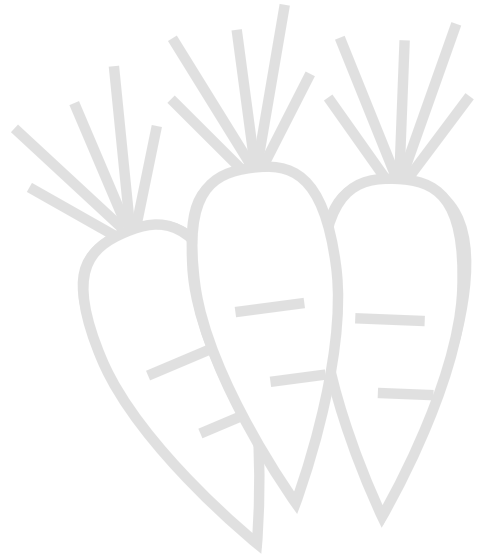
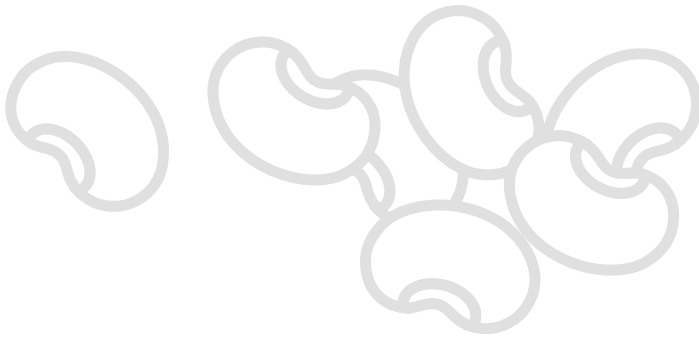
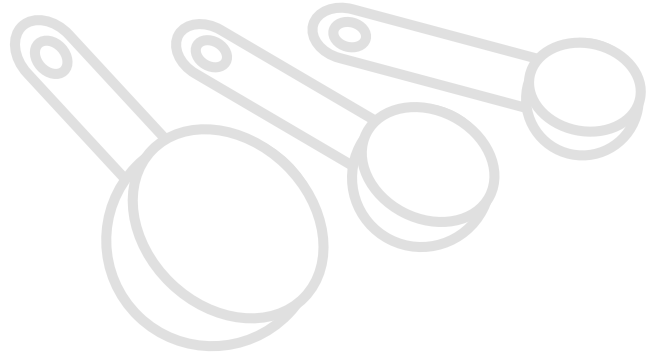
Classroom Extension: Plan a field trip to a senior center where pairs of students can engage in conversation with elders in the community using their prepared interview questions.

ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.W.4.4

Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1-3 above.)



Guest Interest Form Template

Student Name: _____ Guest Name: _____

On _____, we'd like to invite you to our classroom to share your food traditions and cooking experiences.

Would you like to participate?

- Share a story and recipe about a food tradition you have
- Bring in a cooking tool and demonstrate how to use it
- Teach the class a traditional cooking skill
- Share an experience cooking and eating foods

If sharing a skill or food, please briefly describe it:

What supplies would you need us to provide?

Please return this form with your student by _____.

Name: _____ Date: _____

Learning from Our Elders

Directions: After listening to each guest today, write three interesting facts that you learned about the person or his or her experience with food. Write at least two questions you have about what the person shared.

Guest #1 Name _____

What I learned:

Follow-up questions I have:

Guest #2 Name _____

What I learned:

Follow-up questions I have:

Guest #3 Name _____

What I learned:

Follow-up questions I have:

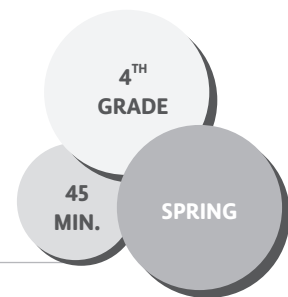
Guest #4 Name _____

What I learned:

Follow-up questions I have:

Food Packaging

THEME: EXPLORING THE ECOLOGY OF FOOD



ESSENTIAL QUESTIONS

How does the packaging of our food affect our environment?

LEARNING OBJECTIVES

- ✓ Students will be able to evaluate the pros and cons of certain materials used for food packaging.
- ✓ Students will be able to identify various materials and determine whether they are recyclable or compostable.

LESSON DESCRIPTION

In this lesson, students consider how an orange comes with its own perfect packaging, and they sort other food packaging to determine the materials used and whether they are recyclable or compostable.

MATERIALS

- Clementine for each student
- Assortment of food packaging, from minimally packaged to highly packaged and some packaging made with post-consumer materials, such as beverage bottles or deli containers made from recycled plastic
- Small, soft ball (to toss among students)
- Source Materials Cards (p. 381)
- Local municipal recycling chart
- Several small bins
- Vinyl tablecloth

PREPARATION

- › You may want to start collecting cleaned food packaging several weeks before implementing this lesson to have a sufficient amount for sorting stations. One way to get a lot of items quickly is to set up a box in a shared space, such as a teachers' lounge, and email school staff asking them to bring in empty, rinsed, food packages.
- › Prepare a set of four or more food packages for each group of 4–6 students. Make sure each set includes a variety of materials (e.g., cardboard, metal, glass, plastic, or natural) and ranges from minimally to highly packaged foods.
- › Photocopy Source Materials Cards for each group of students.

ACTION STEPS

1. Perfectly Engineered Packaging: Gather students in a circle, and pass around a small orange or clementine to each student. Ask students to think about the function of the orange's peel. Ask, *Why do oranges have a peel?* Field answers, and get to the idea that the peel protects the fruit and keeps it clean. Say, *The orange comes with its own packaging. How are other foods that we eat packaged?* Hear responses from students and then explain, *Today, we're going to consider the different ways our food is packaged.* Divide students into

groups of four to six, and provide each group with an assortment of food packaging. **(5 min.)**

2. Sorting the Spectrum of Packaging: Have groups of students sort their objects into a spectrum from those with the least amount of packaging to those with the most. **(5 min.)**

3. Sorting by Where It Came From: Next, hand out the Source Materials Cards, and have each group sort their objects by the materials used. **(5 min.)**

4. Sorting by Where It's Going: Next, hand out a recycling chart for your community to each group as well as several small bins. Have students sort materials again, this time by which are recyclable in your community, which can be composted, and which are destined for the landfill. **(5 min.)**

5. Reducing Your Waste: Once each group has their packaging sorted by where it's going, ask them to bring their landfill items to the vinyl tablecloth you've laid on the ground, making a big class pile. Have students make observations about the pile. Ask, *Are there any items you see here that we could avoid having in the landfill?* Discuss alternative approaches to reducing waste, such as using reusable bags and bulk bins. Ask, *What about objects that we recycled? Are there ways we can reduce sending objects to recycling facilities?* Hold up a plastic water bottle and ask, *What are other ways to get the water without the waste?* As you're discussing single-use plastics, you might introduce the story of the youth activist Milo Cress who started the Be Straw Free campaign when he was nine. **(10 min.)**

6. Compost Hot Potato: Explain how composting is another way to divert waste from landfills. Say, *Compost creates a free, organic "fertilizer" for our plants; it reduces waste that would otherwise go to the landfill; and it takes carbon from decomposing plants that would otherwise go up into the atmosphere and holds that carbon in the soil, which helps slow climate change!* Make a list of all the things that are biodegradable that they can think of and things you could add to a compost pile. Say, *We're going to play a game called compost hot potato. I'll toss the ball to someone and name something we could add to a compost pile. The person who is "it" will stand in the middle and try to tag someone before that person thinks of something new and tosses the ball to another person. If you get tagged before you think of something to add to the compost pile, you're it!* Play the game for several rounds. **(10 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *What are ways we can reduce our use of packaging?*
- *What did you learn today that you'd like to share with others?*
- *What types of packaging do you think are best?*
- *How does the use of food packaging affect our environment?*

ADAPTATIONS

Classroom Extension: Have students choose a food for which to design their own food packaging. Ask them to consider protecting and

marketing the food as well as creating packaging that has the least environmental impact.

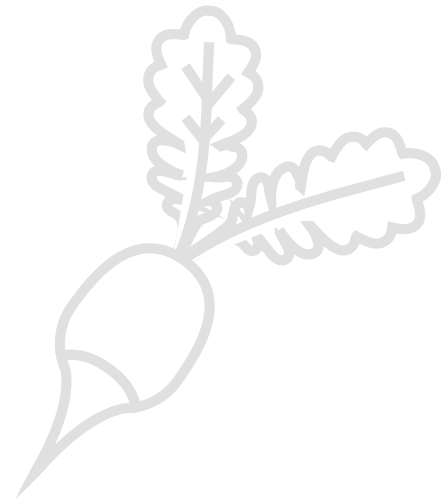
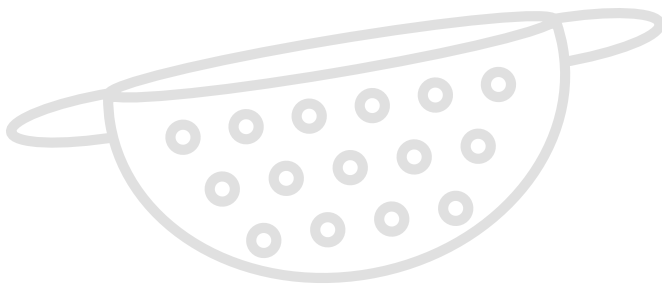
Cafeteria Extension: Explore the possibility of conducting a school-wide waste audit with students. Consult the USDA resource Guide to Conducting Student Food Waste Audits.

ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.SL.4.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 4 topics and texts*, building on others' ideas and expressing their own clearly.



Source Materials Cards

Plastics are typically made of crude oil and coal or natural gas.

Glass is made by heating sand until it melts and turns into liquid.

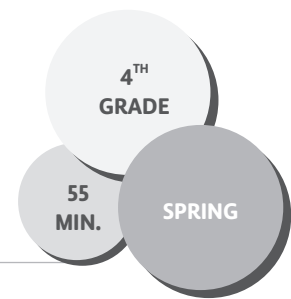
Metal cans are made of steel or aluminum.

Cardboard is made of fiber from trees.

Natural/Biodegradable objects are anything that was once alive!

Garden Grids

THEME: GROWING AND ACCESSING HEALTHY FOOD



ESSENTIAL QUESTION

How do we plan, design, and plant garden beds?

LEARNING OBJECTIVES

- ✓ Students will be able to interpret plant spacing guidelines to plan a garden bed.
- ✓ Students will be able to use accurate measurements to plant a garden bed.

LESSON DESCRIPTION

In this lesson, students use the square-foot gardening method to practice measuring and multiplication. (This lesson can be a follow-up to the 4th grade winter lesson A Patchwork Garden Quilt lesson by having students measure and plant the squares they designed.)

MATERIALS

- Sidewalk chalk
 - 30 Seed packets or seed-spacing guidelines (for students to use for planning)
 - Transplants or seeds students will plant during lesson
 - Ruler for each pair of students
 - String
 - 3 or more hammers
- For raised beds:
- Nails or tacks
- For in-ground beds:
- Stakes
 - Watering cans
 - Popsicle sticks

- Several permanent markers
- Planning a Square-Foot Bed Worksheet (p. 385)
- Pencils

PREPARATION

- › Learn or review how to use a hammer safely; practice it.
- › Get at least two varieties of crops that have distinctly different spacing requirements, such as kale and beets.
- › Determine which three beds in the garden your class will be planting in. If you have raised beds, you'll be creating a grid using string and nails or tacks. If you don't have raised beds, you can easily adapt for in-ground beds. To make your grid, put stakes in the ground every foot, and secure string around each stake.
- › Photocopy Planning a Square-Foot Bed Worksheet for each student.
- › Find and print out seed-spacing guidelines for vegetables grown in your region.
- › Prepare the beds by weeding, and if your soil is very dry, by watering until it is about as moist as a wrung-out sponge throughout.
- › If you have a large class, you might have three rotations of students (as described below). In this case, determine an area of the garden that needs weeding or some other project

students can work on independently.

- › Display the plant spacing information students will need for planting.
- › Prefill watering cans for students to use.

ACTION STEPS

1. Four Square: Have students gather around a four square court on the playground, or draw one yourself with chalk. Ask, *What do we need to consider when we're planting in the garden?* Ask for four volunteers to pretend to be plants, and have each student occupy one square. Then say, *I think I'd like a bigger harvest*, and add four more students. Ask the class, *What did you do to make room for more plants?* Keep adding students to get at the idea of overcrowding plants, and have students make observations about how the plants have to shift to make more space between them and others. **(5 min.)**

2. Introduce Square-Foot Gardening: Explain, *Square-foot gardening is a way to use plant spacing guidelines to plant our crops as closely together as possible without overcrowding them. This allows us to grow as many fruits or vegetables as we can in a small space. We're going to use string and tacks to make a grid on our garden bed that divides it into one-foot squares. If our bed is four feet by four feet, how many one-foot squares would we have?* You might draw lines on your four-square court for students to count. Explain how that means you can plant 16 cabbages in your bed because plant spacing guidelines tell us to plant one per square foot. Ask students other questions to get them practicing area and multiplication (e.g., *If you can fit four lettuce transplants per square foot, how many lettuce plants would*

we have in this bed? How many inches are in a foot? So what is the area of a square foot in inches?) **(5 min.)**

3. Explain the Rotations: Explain the rotations that you've established for students, and share the strategy you'll use to let them know it's time to switch, such as a call-and-response. Review tool safety with students. Divide students into three groups, and make sure each student has a partner within the group. **(5 min.)**

4. Station 1—Measuring the Bed:

a. Have no more than six pairs of students at a garden bed with you at a time. Model for students how you use a ruler to measure one foot across the bed. Then talk about how to use a hammer safely. Finally, demonstrate this skill as you hammer a nail into the wooden edge of the bed at that spot. Do the same along the edge directly across the bed and then pull the string across. Explain that they'll be working with their partner across the bed, but the whole group will have to communicate and coordinate to make the grid and share tools.

b. Have students position themselves across the bed from their partners and supply hammers, nails, and string. If using in-ground beds, the group is working together to set up the stakes.

c. Once the grid is made, explain that each pair of students will have two different crops to plant in two different squares. Refer to the visual of the spacing for your crops. If using beet seeds, for example, show students that they need to be spaced three inches apart. Ask, *How many beet seeds can*

we fit into one square foot? Show students how you can measure with your ruler, or find a twig, measure it against your ruler, and break it off at exactly three inches so it's the right length for spacing your seeds. Then show students how to transplant starts and/or how to sow the seeds. Pass out seeds and transplants, and support students as they're planting. **(10 min.)**

5. Station 2—Planning Bed: Students at this station will be working independently or in pairs on the Planning a Square-Foot Bed Worksheet. Be sure to have pencils, seed spacing guidelines, and seed packets at the station. **(10 min.)**

6. Station 3—Garden Chore: Weeding is a good option here. As motivation, you might make weeding a healthy competition between groups by having each group create a separate pile to compare at the end of the activity. **(10 min.)**

7. Watering and Labeling: After the station rotation, gather as a whole group to admire the freshly planted beds. Have each pair of students create a label for their seeds using a popsicle stick, marking the variety, the date, and their names. **(5 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *How do you think our plants would do if we didn't space them out?*
- *How do you think the square-foot method of gardening compares to other ways of gardening?*

- *What strategies did you find for setting up the square-foot grid with your group?*
- *Ask yourself: Did I use tools safely and work well with my partner?*

ADAPTATIONS

Extension: If you have the space, have students scatter leftover seeds at random in a small area of the garden, and hypothesize about how this garden bed will do in comparison to their carefully measured and spaced bed.

ACADEMIC CONNECTIONS

Math Common Core State Standards

CCSS.MATH.CONTENT.4.MD.A.3

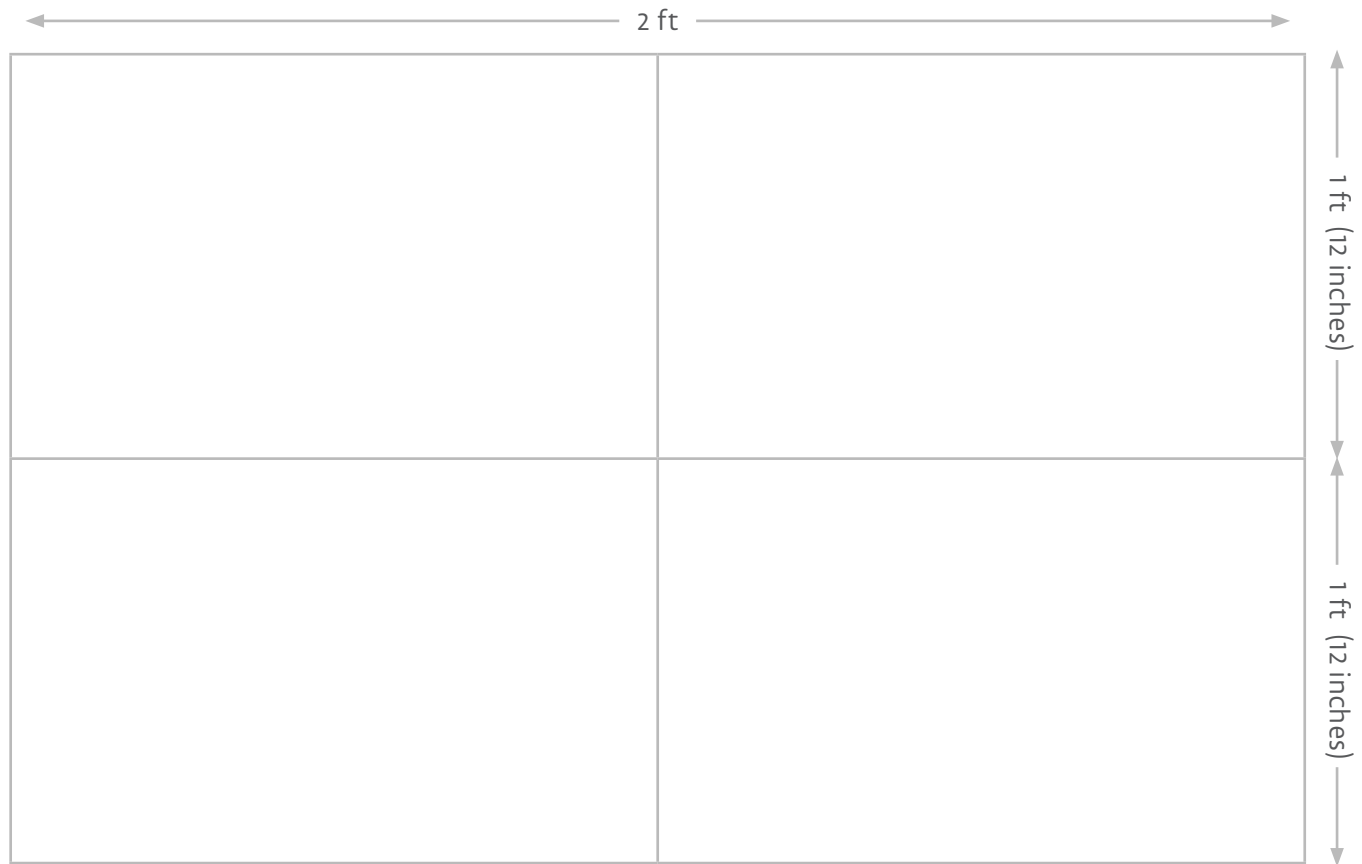
Apply the area and perimeter formulas for rectangles in real world and mathematical problems. *For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.*

Name: _____ Date: _____

Planning a Square-Foot Bed WORKSHEET

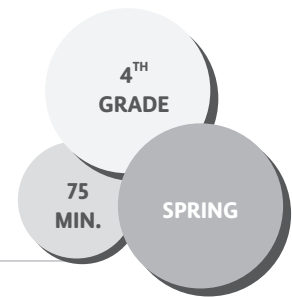
Directions: Choose four different seed packets to plan a bed for. You have four different crops to plant, but only X square feet of space! Using the seed spacing guidelines on the packet, determine how many of each crop you can plant in each square.

You have to plant _____ square feet.



Reimagined Snacks

THEME: PREPARING HEALTHY FOOD



ESSENTIAL QUESTION

How can we reimagine our favorite snacks to make them healthier?

LEARNING OBJECTIVES

- ✓ Students will be able to identify the flavors and textures they enjoy in snacks.
- ✓ Students will be able to name whole or minimally processed foods that have the flavors and textures they enjoy.
- ✓ Students will be able to create an action plan for incorporating whole and minimally processed snacks into their diets.

LESSON DESCRIPTION

In this lesson, students consider their favorite snacks and what flavor and texture attributes make them desirable. The class then makes a whole-foods variation of spicy corn chips in the form of spicy kale chips. Students then brainstorm reimaged snacks, using whole or minimally processed foods and create an action plan to incorporate more of these into their snacks for the week.

MATERIALS

- Toaster oven
- Extension cord
- 2 bunches kale (if you don't have access to a toaster oven or extra hands to help bake the kale chips, try having students slice jicama to sprinkle their spicy mix on)

A tray of the following for each group of 4–6 students:

- 4 small kale leaves
- Medium bowl
- Small bowl for mixing spices
- 1 Tbsp olive oil in small cup
- ½ lime
- Container for compost
- Several sets of measuring spoons
- 2 cooling racks or cookie sheets for transferring kale chips
- Pair of tongs
- Kitchen timer
- Paper towels
- Descriptive Food Words Chart (p. 389)
- Reimagined Snack Brainstorm Worksheet (p. 390)
- Action Plan Worksheet (p. 391)
- Materials for cleanup

PREPARATION

- › If making kale chips, procure a toaster oven! Use your own, borrow one from a friend, or check for one at a thrift store.
- › If making kale chips, this lesson would work best with a volunteer or other extra set of adult hands to supervise baking.
- › Photocopy Action Plan Worksheet for each student.
- › Photocopy Descriptive Food Words and Reimagined Snack Brainstorm for each group of 4–6 students.

- › Wash and thoroughly dry kale leaves to prevent steaming in the oven.
- › Set aside a kale leaf to use as demonstration for students.
- › Prepare trays for each group.
- › Set up a station where you can plug in the toaster oven, and have space for trays of kale chips to cool on cooling racks.
- › Set up another station where representatives from each group can gather to measure spices. Put out spices and several sets of measuring spoons.

Spice Ingredients

1 Tbsp each

- Nutritional yeast
- Cayenne pepper
- Chili powder

1 tsp each

- Garlic powder
- Salt
- Juice of 1 lime

ACTION STEPS

1. Discussing Favorite Snacks: Ask students to discuss in groups, *What are your favorite snacks? Why do you like them?* Then pass out the Descriptive Food Words chart, and have students circle or highlight the attributes of their favorite snacks. **(5 min.)**

2. Discussing Healthy Snacks: Ask students to discuss in groups, *What makes a snack healthy?* Discuss concepts students already know, getting to the idea of whole or minimally processed foods. Ask students for examples of whole or minimally processed foods, such

as fruits and vegetables, popcorn, and whole grains. **(5 min.)**

3. Reimagining Spicy Corn Chips: Ask students, *Who here likes Takis? Why are they so popular? What descriptive words from the list would you use to describe Takis?* (spicy, crunchy, salty, cheesy) Explain, *Today we're going to think about how we can reimagine some of our favorite snacks to have the same flavor and texture attributes but to use whole or minimally processed foods instead. It won't be the same thing, but it's a way to make a snack that is similar.* Tell students that you're going to make spicy kale chips. **(5 min.)**

4. Wash hands break! Preheat toaster oven to 300. **(5 min.)**

5. Model: Show students how they'll destem and break up the kale into small, bite-sized pieces. Then show how they'll massage the olive oil into the leaves. Explain that while most of the group is processing the kale, you'll pick a representative from each group to come up and measure the spice ingredients at the spice station. Once the student returns, they'll toss the spices in with the kale. **(5 min.)**

6. Preparing Kale Chips: Pass out trays of ingredients and materials to each group of students. Call up a student from each group to the spice station. If you have another adult, have them circulate and supervise kale processing while you facilitate students measuring spices. Have students clean up their space before moving on to the next step. **(15 min.)**

7. Brainstorming Reimagined Snacks: Explain that while groups of students take turns baking their kale chips, they're going to brainstorm more

versions of reimagined snacks. NOTE: Each batch of kale chips will take five minutes to bake, so plan timing accordingly. Pass out the Reimagined Snack Brainstorm Worksheet to each group, and briefly go over the examples provided. **(5 min.)**

8. Baking Kale Chips: Meanwhile, call up a couple of students from one group at a time to bake kale chips. Have students lay the kale pieces in one single layer and avoid crowding them. Set a timer for five minutes, but have a student keep an eye on the kale chips to make sure they don't burn. Once they're done, place the tray on a cooling rack, then transfer to a large cookie sheet to free up the toaster oven tray. **(15–20 min.)**

9. Sharing: Have each group share aloud one reimagined snack, noting the snack it's based on and what flavor and texture attributes they were looking to replicate. **(5 min.)**

10. Tasting: Have a volunteer pass out a paper towel to each student. Then go around the room using tongs to pass out a couple chips to each student. **(5 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *Why do we crave certain snacks?*
- *How do you define a whole food? How do you define a minimally processed food?*
- *How would you describe our snack? How does it compare to the snack it was inspired by?*
- *Which snacks would you want your family to reimagine? Why?*
- *What strategies helped for working in our groups?*

ADAPTATIONS

Extension: Have students complete the Action Plan Worksheet. Follow up with students during your next session to see how well they followed through on their set goals.

At Home: Have students interview family members about their favorite snacks and brainstorm whole-foods snacks together.

ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.SL.4.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 4 topics and texts*, building on others' ideas and expressing their own clearly.

CCSS.ELA-LITERACY.L.4.6

Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal precise actions, emotions, or states of being (e.g., *quizzed*, *whined*, *stammered*) and that are basic to a particular topic (e.g., *wildlife*, *conservation*, and *endangered* when discussing animal preservation).



Descriptive Food Words

FLAVOR	TEXTURE
Bitter	Bubbly
Cheesy	Crackly
Creamy	Crispy > Crunchy > Chewy > Soft
Hot	Effervescent
Milky	Fizzy
Rich	Gummy
Salty	Light → Dense
Smoky	Silky
Sour	Smooth
Sweet	Soft
Spicy	Sticky
Tangy	Thick
Tart	Velvety
Other? _____	Other? _____

Name: _____ Date: _____

Reimagined Snack Brainstorm Worksheet

SNACK	FLAVOR	TEXTURE	REIMAGINED SNACK
Example: Soda	sweet	fizzy	Bubbly water + splash of juice
Example: Spicy corn chips	spicy	crunchy	Spicy kale chips

Name: _____ Date: _____

Action Plan Worksheet

Goal: Reimagine a snack using whole or minimally processed foods.

Steps: Create a reimaged snack that will have the flavor and textures of a snack you typically eat. To create a new habit, try eating your reimaged snack a few times this week.

Draw: Your typical snack

FLAVOR



TEXTURE

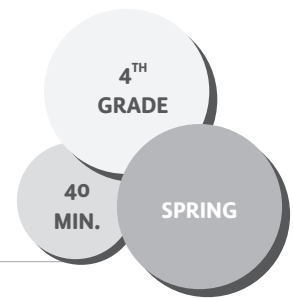
Draw: Your reimaged snack

TRACK HOW YOU DO!

Date I made and ate my new snack:	Date I made and ate my new snack:	Date I made and ate my new snack:
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Mealtime Traditions Around the World

THEME: CONNECTING FOOD, CULTURE, AND COMMUNITY



ESSENTIAL QUESTION

Why do cultures create traditions and habits around eating food?

LEARNING OBJECTIVE

✓ Students will be able to compare and contrast the mealtime traditions of various cultures.

LESSON DESCRIPTION

In this lesson, students learn about mealtime traditions from other cultures by taking a walking tour of the world.

MATERIALS

- Mealtime Traditions Posters from five different regions around the world (pp. 394–398)
- 1 Mealtime Traditions Worksheet for each student (p. 399)

PREPARATION

- › Print and hang the Mealtime Traditions Posters in different spots around the room.
- › Photocopy the Mealtime Traditions Worksheets.

ACTION STEPS

1. Engage: Explain that today you'll be discussing some mealtime traditions from around the world. Ask students, *What are some traditions or habits your family or culture has around mealtime?* Discuss student responses. **(5 min.)**

2. Explain the Activity: Explain, *You'll be going on a world tour today. In teams, you'll travel to a particular region of the world. Together, you'll read about the mealtime customs in that region, and use that information to answer the questions on your worksheet.* Explain that some families in the United States also eat these ways because immigrants have continued their traditions. Remind students that it is important when discussing culture to be respectful of differences. **(5 min.)**

3. Conducting Research: Have students count off from one to five to make even teams. Then send each team to a different photo. They can work together to read the information, look at the image, and discuss it. Then have each student complete their own worksheet about Mealtime Traditions in the region assigned to them. **(15 min.)**

4. Scramble Gallery Walk: Have everyone write their own name and the name of their region on the bottom of their worksheet, then fold it over twice to hide that information. Next gather students and collect all the worksheets. Shuffle them. Explain, *Now I'm going to give you a worksheet completed by someone else. Your job is to read the information on the worksheet, walk around to look at the photos and descriptions of mealtime traditions, and try to match the worksheet to a region of the*

world based on the information. Once you think you've got it, open up the bottom to see if you were correct. Then you can refold it and trade with someone else who also made a match. Continue trying to match worksheets to regions until I call you back together. **(10 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- What surprised you when learning about mealtime traditions from around the world? Did you notice anything different from your own traditions?
- What are similarities among different mealtime traditions? Did you notice anything similar to your own traditions?
- Why do you think cultures create traditions and habits around eating food? What purpose do these traditions serve?

ADAPTATIONS

Extension: Students brainstorm their own mealtime traditions to adopt in the cafeteria at lunchtime or in their classroom during snack or FoodCorps lessons.

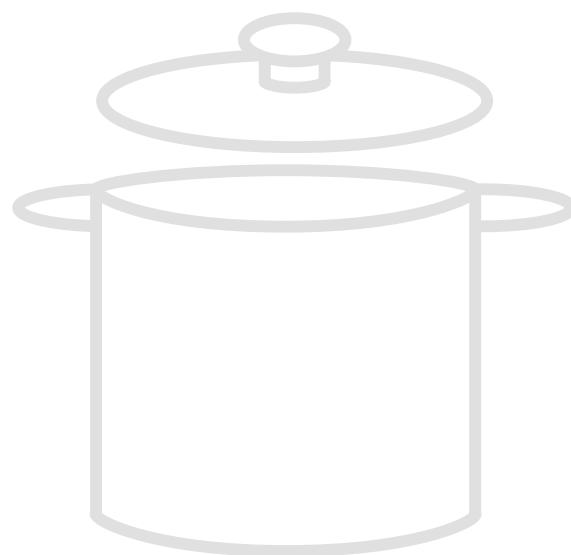
Research: Have students research lingering questions about the cultures in the countries they learned about. One approach could be connecting with community members to learn more about specific mealtime traditions.

ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.RI.4.1

Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.



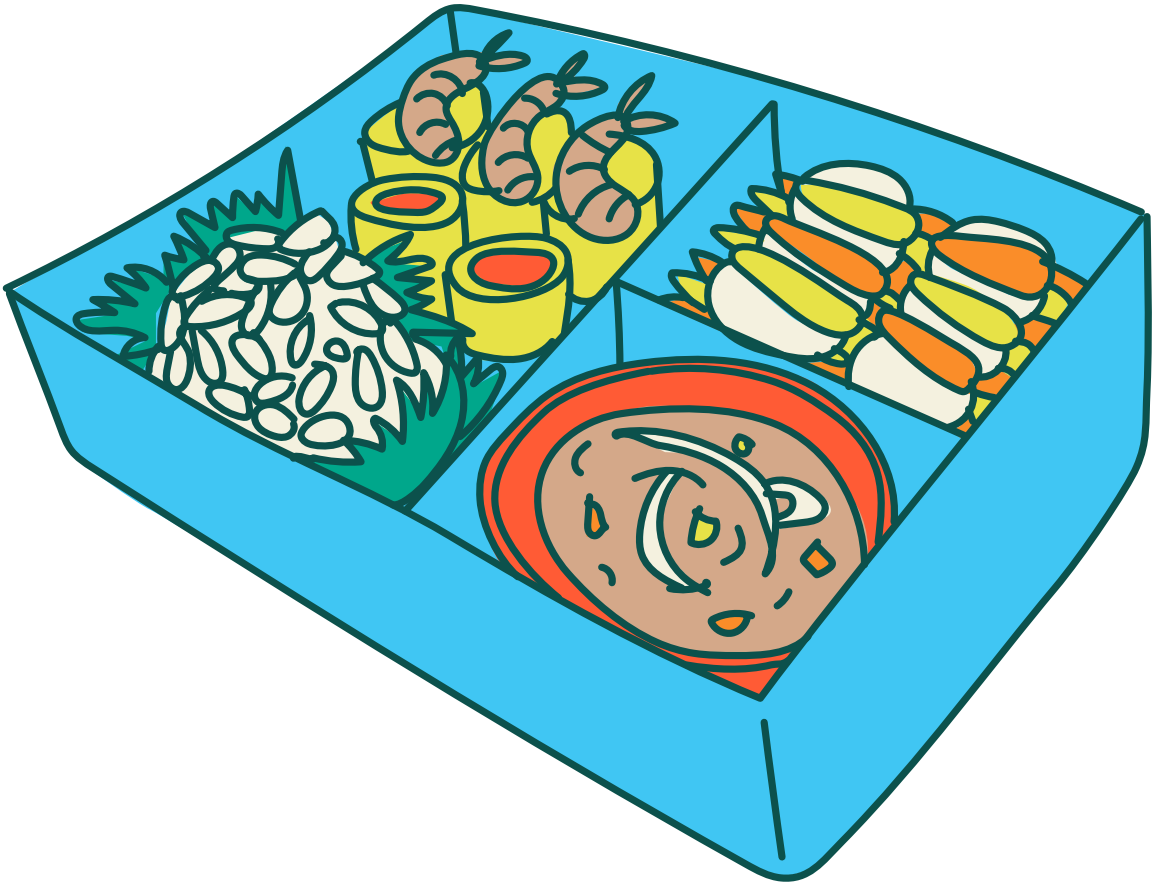
MEALTIME TRADITION EXAMPLE

Ethiopia: In Ethiopia, people eat food with their right hand only, usually with a piece of bread called injera. Everyone eats from one really big sharing plate in the middle of the table, instead of having their own plates. You should eat what's closest to you on the plate instead of reaching across the table.



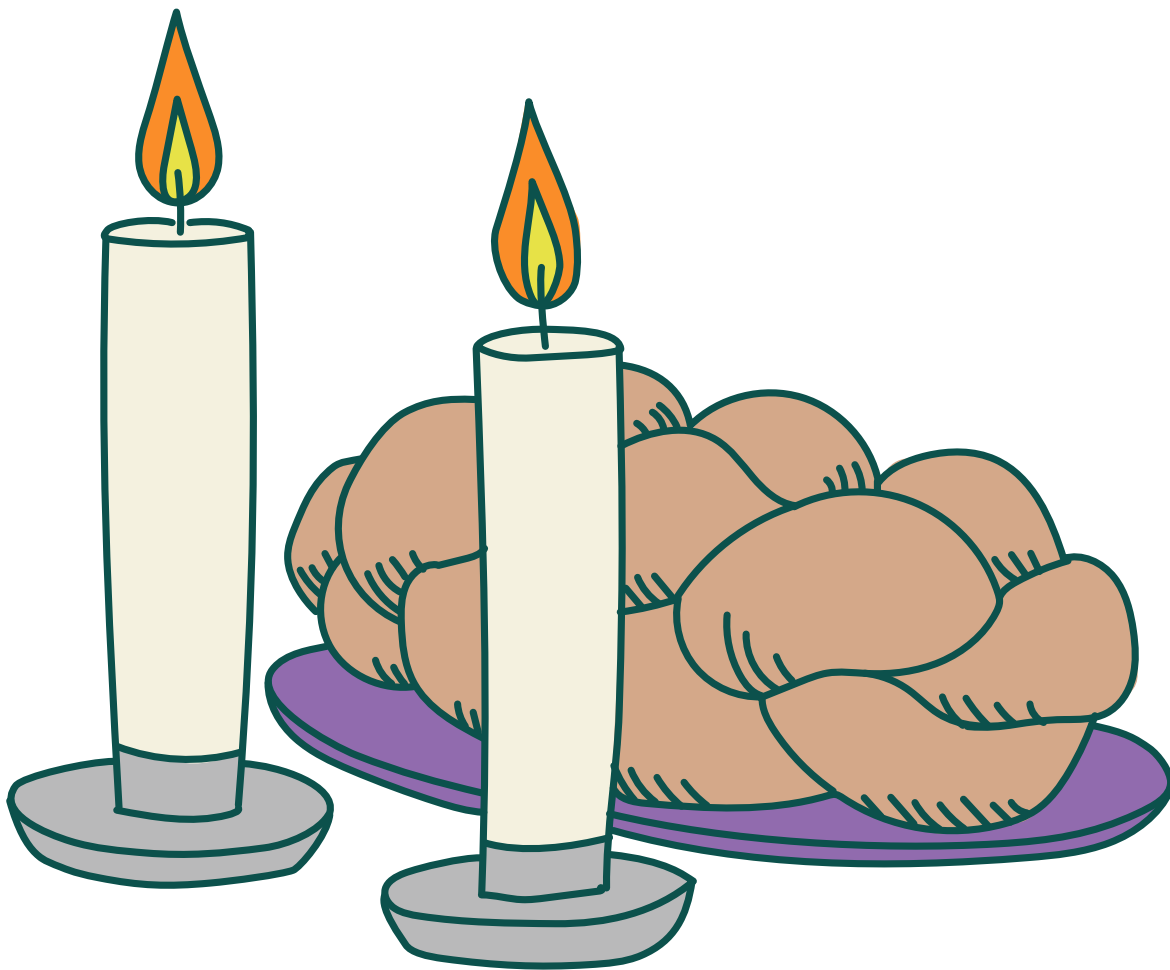
MEALTIME TRADITION EXAMPLE

Japan: In Japan, people prepare bento, a box-shaped container, for lunch. It has fish or meat, vegetables, and rice in separate compartments. It's popular for parents to make bento boxes for their children's lunch at school and shape the food into different cartoon characters. When eating a hot noodle soup, it's OK to make slurping sounds.



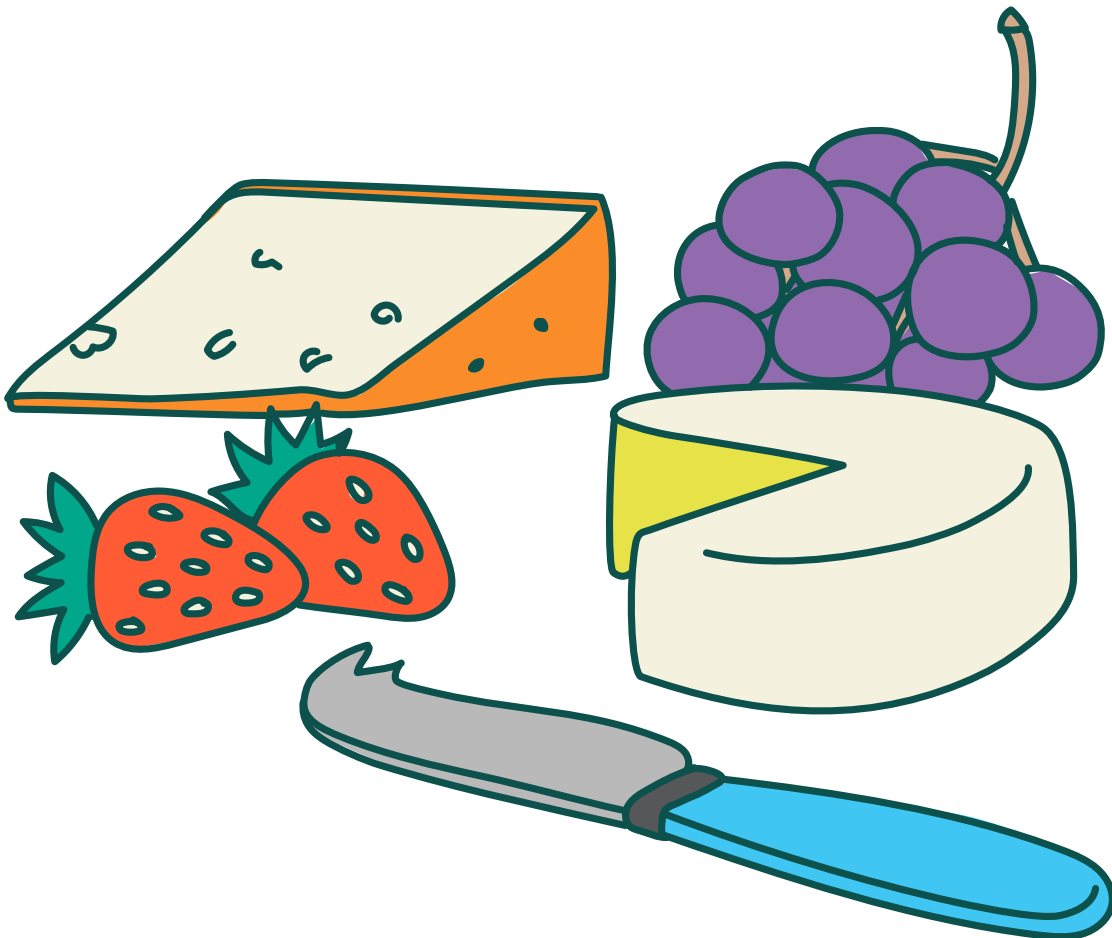
MEALTIME TRADITION EXAMPLE

Israel: In Israel, people who are Jewish honor Shabbat, which is from sundown on Friday to sundown on Saturday. During that time people are expected to rest and not use any technology. Dinner includes challah, a light egg bread, and is a time to connect with friends and family over candlelight.



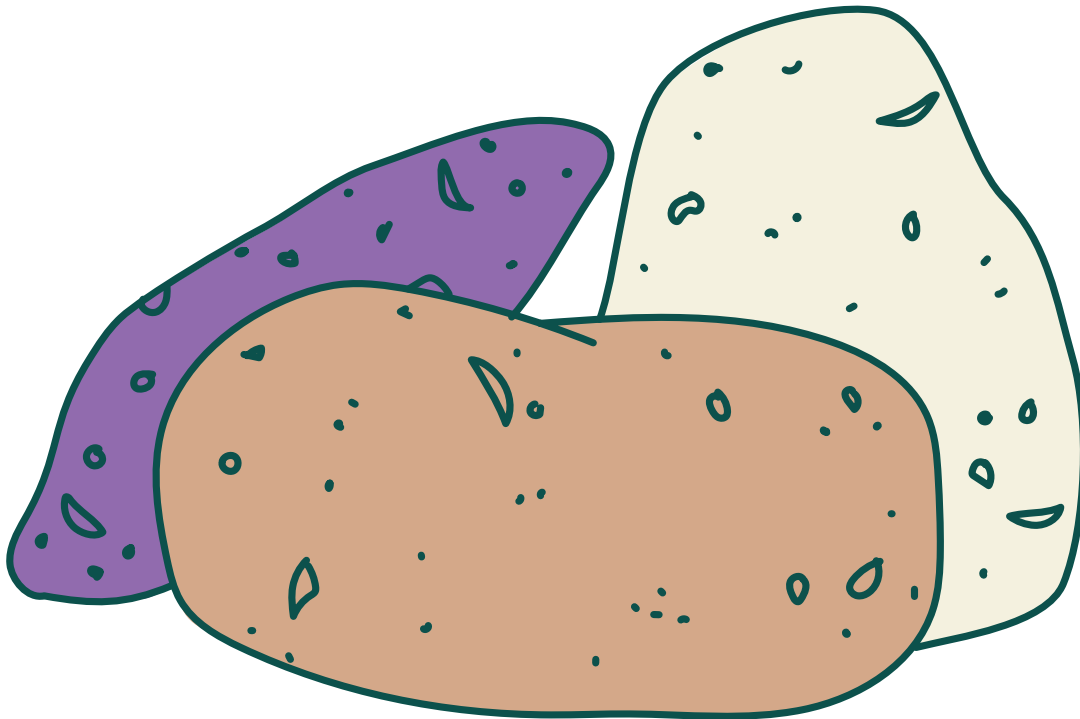
MEALTIME TRADITION EXAMPLE

France: In France, people like to eat a nice long meal together. Usually meals are a communal time that lasts at least one hour, and families and friends talk and enjoy each other's company. You should always keep your hands above the table. French people often eat cheese and fruit as dessert.



MEALTIME TRADITION EXAMPLE

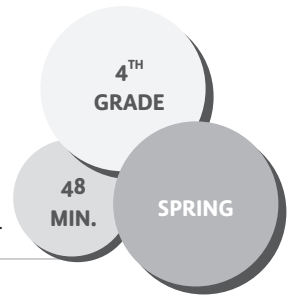
Peru: In Peru there are more than 5000 varieties of potatoes, the biggest in the world. However, the mixing of cultures and the variety of climates determine the variety of local cuisine. On the coast, people eat ceviche, a dish of marinated raw fish or seafood. In the valleys and plains, the diet is still a traditional one based on corn and potatoes. Meat comes from indigenous animals like alpacas and guinea pigs but also from imported livestock like sheep, cattle and swine.



Plant a Salsa Bed

THEME: GROWING AND ACCESSING HEALTHY FOOD

Step 6 follow-up after two weeks: 10 min.



ESSENTIAL QUESTION

What actions and intentions can we set today that will benefit us in the future?

LEARNING OBJECTIVES

- ✓ Students will be able to transplant a seedling in the garden.
- ✓ Students will be able to set intentions for the future.

LESSON DESCRIPTION

In this lesson, students will plant starts for a salsa garden bed that they will harvest and enjoy as fifth graders. They will also “plant” intentions that they can revisit at the start of the next school year.

MATERIALS

- *Farmer Will Allen and the Growing Table* by Jacqueline Briggs Martin
- Chart paper or whiteboard
- Permanent markers
- 4–5 starts of each of the following:
 - onion
 - tomato
 - pepper
 - cilantro (or seeds)
- Digging fork
- Trowels
- Watering cans
- Hose for filling watering cans

- Wooden paint stirrers, wide horizontal blinds that you can cut up or any other material you can use as plant markers that are wide enough to write on
- Permanent markers of various colors
- Newspaper or tablecloth to protect table (optional)

PREPARATION

- › Enlist the help of a classroom teacher or parent volunteer to supervise the art project while you supervise the planting station.
- › Get onion sets, tomato and pepper starts, and cilantro seeds or starts. Determine the number of starts you’ll need, considering the amount of space in your garden bed and the number of students in your class.
- › Write the following sentence frame on chart paper or a whiteboard where everyone can see it: “Intention: Today I will _____, so that in the future I can _____.”
- › Create a model of an Intentions plant stake that is colorful and includes a personal intention on one side, using the sentence frame above, and the name of one of your crops on the other.
- › Choose an appropriate area to establish your salsa bed. You’ll want to plant in a space that gets maximum sunlight for heat-loving crops.
- › Prepare the soil for planting by clearing debris and weeds and loosening soil if needed with a digging fork.

- › Set up a station for students to work on their Planting Intentions craft project, including permanent markers and wooden paint stirrers.

ACTION STEPS

1. Engage: Gather students in a circle and say, *Today we're going to be planting a gift for ourselves to enjoy this fall. These will be our ingredients. Can you guess what we'll be making in the fall?* Show them your various plant starts and seeds, and have them guess what they're all for (salsa!). **(3 min.)**

2. Reading: Read, or have your guest read, *Farmer Will Allen and the Growing Table* to students. **(5 min.)**

3. Explain the Activity: Reiterate to students how any time we plant something in our garden, just like Farmer Will Allen, we're being kind to our community and our future selves. Say, *When we plant these plants, we're setting an intention of creating a delicious meal for ourselves and others. What are other things we do now that benefit our future selves?* Ask students to turn and talk to a neighbor and then share as a class. Students might say brushing their teeth, eating healthy food, doing well in school, practicing a sport or musical instrument, learning a new hobby, or saving money. Explain, *Eating healthy food is an example of a favor we can do for our future selves. Today, in addition to planting our ingredients for salsa, we'll also be planting intentions for things we can do today as a favor to our future selves! To write out your intention, you can complete this sentence: "Today I will _____, so that in the future I can _____."*

For example, "Today I will eat lots of vegetables, so that in the future I can be healthy and strong enough to play my best soccer game!" Ask, *What's something you can do now or in the next few months that will help your future self?* Explain that you'll be pulling groups one at a time to plant. Split students into different groups based on what start each group will plant (i.e., have an onion group, a tomato group, a pepper group, and a cilantro group.) **(5 min.)**

4. Writing Intentions: Help students get started on their Planting Intentions project by showing them your example. Set expectations for how students will be sharing and using supplies. Explain how when you call their group, they'll temporarily leave their project, do their planting, and then get right back to working on their Intention plant stake. **(25 min.)**

5. Planting Starts: Meanwhile, call one group up at a time. Show students the start their group will be planting, and briefly explain that plant's unique needs and planting requirements. Demonstrate how to properly transplant, modeling proper tool safety. Then have groups of two or three students plant and water the transplant. **(6 min. each)**

6. Planting Intentions: Have students clean up their projects, and then have a mini ceremony where students share their intentions aloud and "plant" their intentions in the ground. Return to the garden a few weeks later, and invite students to reflect together: *How have you been following through with your intention? Are there any obstacles getting in your way? How can we support our classmates in following through on their intentions?* **(10 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *How will our garden bed help us in the future?*
- *How will our garden bed help the garden ecosystem?*
- *We talked today about things we can do to benefit our future selves. What can we do to benefit other people in the future?*
- *When do you think our plants will be ready to harvest?*
- *Ask yourself: What can I do to make sure I follow through on the intention I planted in the garden today?*
- *Ask yourself: Was I safe and respectful in the garden today?*

ADAPTATIONS

Writing Extension: In *Farmer Will Allen and the Growing Table*, your students heard about how Will Allen “can see what others can’t see.” Ask students what they think this means. One word for what Allen could see is “potential.” Define “potential” for your students as *having the ability to change or become something different in the future*. Invite students to write about an example of potential in their own lives. Provide them with the following sentence frame to complete: “When I see _____, I see _____.” Then provide some examples such as, “When I see an empty garden bed, I see salsa!” or “When I see an empty handball court, I see a fun game happening!”

Art Extension: Discuss the same theme described above in the Writing Extension, but

instead of writing about potential, have students illustrate it. Have them fold a piece of paper in half, and on the left write, “When I see _____” and on the right, write, “I see _____.” On the left, have them illustrate what they literally see (such as an empty garden bed), and on the right have them illustrate what they can imagine or the potential (such as a bed full of plants or a bowl of salsa).

ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.RL.4.1

Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.

Sample Intention Plant Stake



TODAY
I'll
eat
vegetables,
so
in
the
future
I'm
strong
enough
to
make a
soccer
goal!



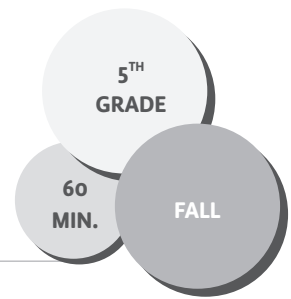
The background of the page is a light gray color with a repeating pattern of various fruits and vegetables. The items include watermelon slices, lemons, carrots, broccoli, mushrooms, and other produce, all rendered in a simple, line-art style.

Fifth Grade

LESSONS

Full Potential Manifesto

THEME: LIVING UP TO OUR FULL POTENTIAL



ESSENTIAL QUESTIONS

What does living up to your full potential mean to you?

How can a manifesto help you live up to your full potential?

LEARNING OBJECTIVES

✓ Students will be able to define what living up to their full potential means to them.

✓ Students will be able to identify achievable steps to work toward living up to their full potential.

LESSON DESCRIPTION

This lesson, which could work well as a new-year or beginning-of-school-year activity, guides students in writing personal wellness manifestos through which they explore what it means to “live up to your full potential.”

MATERIALS

- Piece of large paper for each student
- Markers, crayons, or other drawing supplies
- Old magazines
- Glue sticks
- Scissors
- Crafting Your Full Potential Manifesto Worksheet (p. 409)

PREPARATION

- › Create your own full potential manifesto to share as a model for students.
- › Photocopy the Crafting Your Full Potential Manifesto Worksheet.
- › Display the 1917 US Food Administration Poster “Food, Don’t Waste It.”

ACTION STEPS

1. Freewriting: Ask students to think about how they want to feel and what they want to do and accomplish in the new year. Ask them to freewrite or draw about this question for five minutes. *(5 min.)*

2. Defining Full Potential: Say, *Today we’re going to think about what it looks like to live up to our full potential.* Ask students to share with a partner what comes to mind when they think about the phrase “living up to your full potential.” Explain that *your potential is what you’re capable of, so part of living up to your full potential is getting better at things over time.* Give a personal example, such as “To reach my my full potential, I want to get better at or learn another language.” Then have students work in pairs to complete the following sentence for themselves: “To reach my full potential, I want to get better at _____.” Have pairs share their sentences, and record students’ responses on the board. They might

include pursuing interests or hobbies, being active, eating food that is nutritious, reaching academic goals, etc. **(5 min.)**

3. What's a Manifesto?: Tell students, *Today we're each going to create a personal Full Potential Manifesto. A manifesto is a written statement declaring publicly the intentions, motives, or views of its writer.* Explain that during World War I the US Food Administration published a manifesto about food. Display the 1917 poster, and instruct students to discuss their impression with their partner. Ask, *What views are reflected in the statements on this poster?* Explain to students that their manifestos can be the types of foods they'd like to eat, a new activity they'd like to try, and something new they'd like to learn. Encourage students to think about their own manifestos as encompassing their whole self. Ask, *What's a goal related to your brain? What's a goal related to your heart? What's a goal related to moving your body and eating healthfully?* **(10 min.)**

4. Creating Manifestos: Pass out the Crafting Your Full Potential Manifesto Worksheets, and go over the guidelines of the project, explaining they can use words or images or a combination of the two. Explain that they will be sharing their manifestos with at least one other student in the class. Have students work on drafting their manifesto for ten minutes before passing out paper and art supplies. Remind them to work neatly and carefully. Circulate through the room, supporting students who need guidance. After another twenty minutes, ask students to clean up their spaces. Students may need another work session to complete their manifestos. **(30 min.)**

5. Sharing with Partners: Have students find an aspect of their Full Potential Manifesto that they feel comfortable sharing with a partner. Put them in pairs and have them share. **(5 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *How did it feel to create a personal manifesto?*
- *How will you make sure you are doing the things you expressed in your Full Potential Manifesto?*
- *How can we ask for friends and family members to support us in carrying out our manifestos?*
- *How can we support our friends in living up to their full potential?*

ADAPTATIONS

Follow-Up: Assign or have each student choose a classmate to be their accountability buddy. Record which students are paired so that you can remind them next time. They can have regular check-ins, for example monthly, to reflect together on how well they are fulfilling the goals expressed in their manifestos. You can also have them revise their manifestos periodically, such as at the beginning of a new semester, to highlight that this can be a living document that will grow along with them as they learn more about wellness over time.

Extension: You might have students create a school food or wellness manifesto modeled after the 1917 US Food Administration poster, laying out the tenets they'd want their school

to live by. They can then come up with actionable steps for how to implement changes in their school environment.

ACADEMIC CONNECTIONS

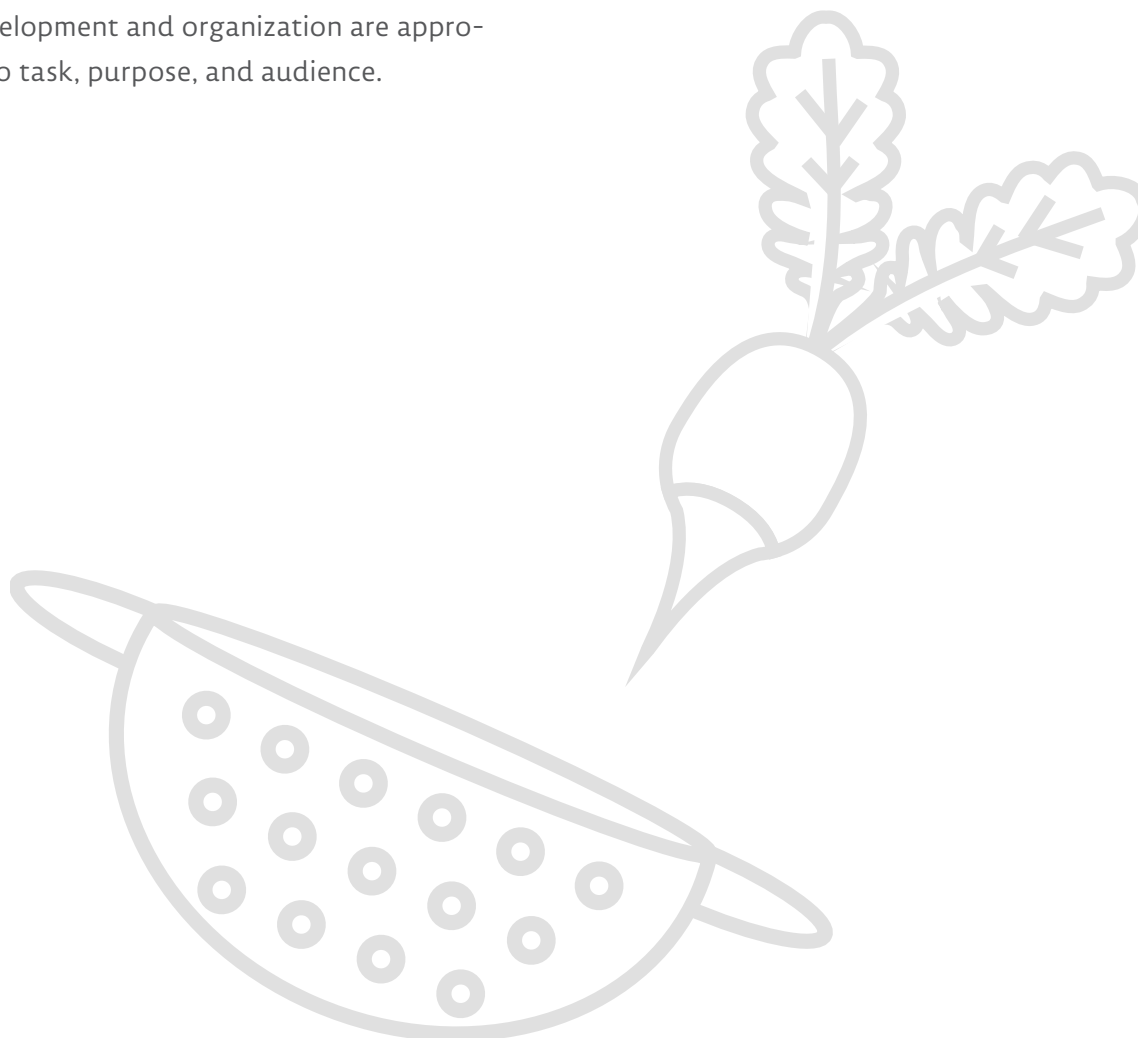
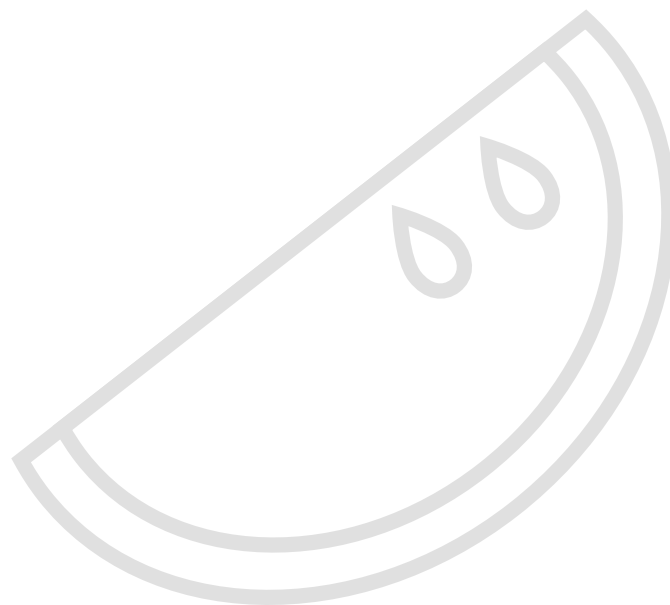
English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.RI.5.3

Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.

CCSS.ELA-LITERACY.W.5.4

Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience.



Name: _____ Date: _____

Crafting Your Full Potential Manifesto Worksheet

Directions: Use your full piece of paper to create your own manifesto that demonstrates how you intend to live up to your full potential this year.

Format: Your manifesto can be a poem, list, collage, drawing, or comic. To convey your intentions, use whatever format you would like.

Requirements:

- Include words or images to show how you want to feel.
- Include words or images to show what you want to accomplish.
- Use the whole paper. If you're mostly using words, write big and bold! If you're mostly using images, be sure to not leave a lot of white space on the page.
- Include the following sentences:

To reach my full potential, I want to get better at:

_____.

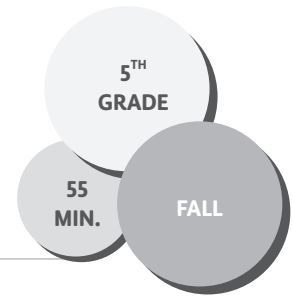
To help me do that, here are some health-promoting foods I can eat:

_____.

Write or sketch your rough draft below:

What's in My Salsa?

THEME: MAKING HEALTHY FOOD CHOICES



ESSENTIAL QUESTION

What informs our food choices?

LEARNING OBJECTIVES

- ✓ Students will be able to interpret nutrition labels.
- ✓ Students will be able to compare and contrast homemade and store-bought salsas.

LESSON DESCRIPTION

In this lesson, students compare and contrast homemade and store-bought salsas by reading nutrition labels and making their own salsa.

MATERIALS

- Salsa ingredients (double or triple recipe, depending on class size)
- 2 jars of store-bought salsa
- Spoon for mixing
- 1–2 bags of tortilla chips
- Nutrition labels for one store-bought, shelf-stable salsa (the more processed, the better) and one store-bought, refrigerated salsa
- Salsa recipe
- Materials for cleanup

Tray with the following for each group of 4–6 students:

- Washed and portioned ingredients (see recipe)
- Cutting mats
- Knives
- Bowl of chips
- Bowl for salsa
- Bowl for store-bought salsa
- Container for compost

PREPARATION

- › Find, print, and photocopy salsa nutrition label samples.
- › Display the salsa recipe on board or chart paper.
- › Prepare trays of materials and ingredients for each group.

Salsa (Pico De Gallo) Recipe

- 2 medium tomatoes, chopped
- 1/2 small onion, finely diced (about 1/3 cup)
- 1/4 cup cilantro, finely chopped
- 1 clove garlic, minced
- Juice of 1/2 lime, or more to taste
- Salt, to taste

ACTION STEPS

1. Discussing: Ask students, *How often do you read the nutrition labels on your food? What does the nutrition label tell you? How does reading the label influence any choices that you make?* Explain that, today, students will get a chance to make their own salsa and compare it to store-bought salsa. **(5 min.)**

2. Comparing Ingredients on Nutrition Labels:

Pass out the sample nutrition labels for your two different types of salsa. Have students read the labels in pairs and make observations. Provide guiding questions, such as *What differences can*

you spot between the ingredients lists? Which has more ingredients? Are there any ingredients in the list that surprise you or that you've never heard of? Share observations as a class and explain, *One of these is shelf-stable, which means it's made to last on a shelf for a long time, and the other is refrigerated. Can you guess which is which?* Discuss how we consider the shelf-stable one more highly processed, but the refrigerated ones sometimes have preservatives to make them last longer as well. Have students preview the salsa recipe you'll be making together. Ask them to compare the ingredients to those listed on the store-bought nutrition labels. **(10 min.)**

3. Wash Hands Break! (5 min.)

4. Knife Safety Demonstration (5 min.)

5. Making Salsa: Assign team leaders in each group whose job will be to read the recipe and give roles to each person in the group. Pass out trays of ingredients and materials; (setting aside tortilla chips for now) and circulate through the room, making sure students are being safe; provide support where needed. Give students a two-minute warning, and then have them clean up their spaces. **(15 min.)**

6. Tasting: Remind students that they're not going to eat until you say, then pass out bowls of chips and bowls of store-bought salsa. Remind students not to double-dip chips and to use a napkin rather than lick their fingers. Before having students taste, ask them to make observations of how the salsas look and smell. **(10 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *What words describe the taste of our homemade salsa? How about the texture? How is it different from the store-bought salsa or salsas you've had in the past?*
- *What other ingredients would make our homemade salsa tasty?*
- *Do you think you're more or less likely to read nutrition labels after today's lesson? Why?*

ADAPTATIONS

Literacy Extension: Have students draw Venn diagrams, and fill them in to show the similarities and differences between the store-bought salsa and the one they made.

Garden Setting: Have different groups make different salsas, depending on what's in your garden. You could have salsa that includes spicy peppers, a salsa that replaces tomatoes with sweet fruits like strawberries, a salsa made from tomatillos, or even green tomatoes that never had a chance to ripen!

ACADEMIC CONNECTIONS

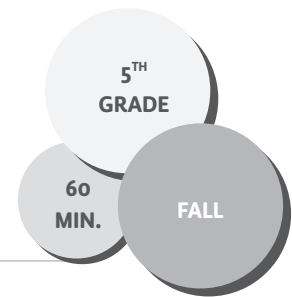
English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.RI.5.7

Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.

What Do Plants Eat?

THEME: EXPLORING THE ECOLOGY OF FOOD



ESSENTIAL QUESTION

How does the process of photosynthesis affect us as humans?

LEARNING OBJECTIVES

- ✓ Students will be able to explain the process of photosynthesis.
- ✓ Students will be able to explain how the process of photosynthesis benefits all animals, including people.

LESSON DESCRIPTION

In this lesson, students work in groups to put together a puzzle of the photosynthesis process. Then, after checking for understanding as a class, the groups make the process come alive by creating and performing photosynthesis skits.

MATERIALS

- A simple, healthy, plant-based food for students to taste, such as slices of fruit or cubes of whole wheat bread
- For each group of 4–6 students:
 - Photosynthesis Puzzle Kit, which includes images of a plant, the sun, a CO₂ molecule, water, and IN and OUT arrows (p. 417)
 - Brown paper bag
 - Photosynthesis Role Cards (p. 415)
 - Copy of Sample Photosynthesis Skit (p. 416)
 - Photosynthesis Poster (p. 418)

PREPARATION

- › Prepare food for students to taste.
- › Photocopy and cut out components of Photosynthesis Puzzle Kit for each group, and put components in brown paper bag to conceal them.
- › Photocopy and cut out Photosynthesis Role Cards for each group of 4–6 students.

ACTION STEPS

1. Food as Matter and Energy: Gather students in a circle and share a tasting. Give each student a slice of fruit or a cube of whole wheat bread. Ask, *Why do we need to eat?* As students share, explain that food is what gives us matter, or substance, to grow and energy to do things. Then ask, *If we get matter and energy from eating food, how do plants get their matter and energy to grow?* Accept any answers. *Did you know plants get their matter from air and water, and their energy from the sun?* Tell students that the name of this process is photosynthesis. Ask them to imagine if they could photosynthesize. Say, *Any time you were tired or hungry, you could just go out and stand in the sun to feel energized and full. That's what the plants do! (5 min.)*

2. Solving Photosynthesis Puzzle: Explain to students that you have a photosynthesis puzzle

for them to solve in groups to determine how plants make their own food. Say, *You'll be racing against other teams to see who can solve it first. When your group thinks you've solved it, have everyone raise their hands, and I'll come over and check.* Pass out a kit to each group of students, and ask them not to open the bags until you give the signal. Then have students race. Circulate through the room, keeping an eye out for group members who raise their hands. Have groups keep going until the last group has solved it correctly. **(10 min.)**

3. Photosynthesis Model: Display the Photosynthesis Poster, and go over the process as a class. Say, *The plant takes in the sun's energy through its leaves. It takes in carbon dioxide from the atmosphere through the leaves. Water travels through a plant's roots and up through the stem to the leaves. Inside the cells of the plant's leaf, the energy from the sunlight allows the plant to turn water and CO₂ into sugar. The plant then lets out oxygen.* Give students time to rearrange any objects or arrows on their puzzles to make them accurate. **(5 min.)**

4. Creating Skits: Say, *Now imagine if these different parts of the process could speak! We're going to create skits to help explain how a plant makes its own food.* Explain that in groups they will develop dialogue to help demonstrate how these ingredients work together. (If it's helpful, you can reference the Sample Photosynthesis Skit at the end of this lesson for ideas about what this might look like.) Pass out a set of Photosynthesis Role Cards to each group. If they have additional people in their group, encourage them to create extra roles that tie in to the process. Have students work on writing the script for the first

ten minutes, and assign groups to different areas to stand up and rehearse it. Circulate through the room, encouraging students to incorporate as much physical movement as they can. **(20 min.)**

5. Performing: Have a couple groups volunteer to perform their skits for the class. Remind students to project their voices and include as much physical movement as they can. Remind the rest of the class to be a respectful audience by remaining quiet and attentive during the performance. Ask students, *While watching the skit, what did you learn about photosynthesis that you didn't realize before?* **(15 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *How is a plant's process of getting energy different from that of animals?*
- *There are many people, including adults, who may not remember exactly how photosynthesis works. How would you explain the process of photosynthesis to someone else?*
- *What do you think might happen if a plant doesn't get enough water or sunlight?*
- *What environmental issues affect photosynthesis?*

ADAPTATIONS

Non-Competitive Race Option: For the photosynthesis puzzles, if you think racing against other teams might present a management challenge, you can instead have the teams race against the clock, saying something like, *I'm giving teams puzzles to put together. My*

challenge to you is to see if every team finishes their puzzles in less than five minutes!

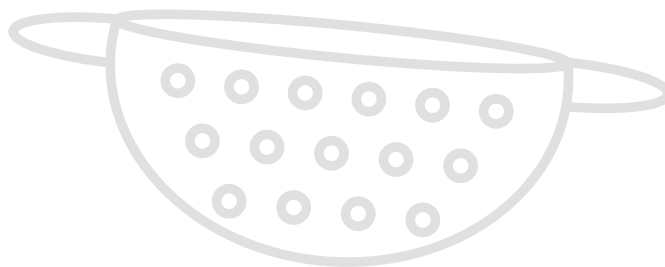
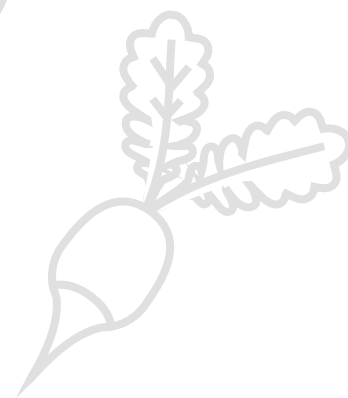
Performing a Prewritten Skit: Depending on the specific academic needs and abilities of the students in your class, you might have students perform the Sample Photosynthesis Skit provided at the end of this lesson in their groups rather than writing their own skit.

ACADEMIC CONNECTIONS

Next Generation Science Standards
Life Science Disciplinary Core Idea

NGSS.LS1.C.

Food provides animals with the materials they need for body repair and growth and the energy they need to maintain body warmth and for motion. Plants acquire their material for growth chiefly from air and water.



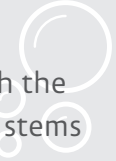
Photosynthesis Role Cards



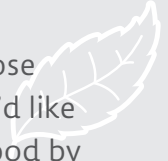
You're the Sun. The energy you emit through your rays of sunshine help the plant make its own food.




You're Carbon Dioxide, also known as CO₂. The plant breathes you in through its leaves.



You're Water. You travel through the plant's roots and up through its stems to the leaves where the plant mixes your molecules (H₂O) with Carbon Dioxide (CO₂) to make sugar.



You're a Plant. You can choose whichever type of plant you'd like to be! You make your own food by capturing energy from sunlight and using water (H₂O) and (CO₂) to make sugar in your leaves.



You're an animal. You breathe in oxygen that plants release through the process of photosynthesis. To get your energy, you also eat plants and animals that eat plants.

Sample Photosynthesis Skit

CHARACTERS: Plant, Sun, Atmosphere, Water | **NON-SPEAKING CHARACTERS:** Sugar, Carbon Dioxide

Plant: [waking up and stretching] I am hungry! Lucky for me, Sun is out today. Good morning, Sun!

Sun: Good morning!

Plant: Would you mind shining some of your light on my leaves here?

Sun: Going to cook some food for yourself? I'm happy to help.

[Sun hands over rays of light to Plant]

Plant: Thanks. Now I need to find CO₂ in the air.

Plant: [shouts toward sky] Yoo-hoo, Atmosphere. I can't see you, but I know you're out there.

Atmosphere: Morning, Plant. I'm here. Same as usual? You need some CO₂ molecules?

Plant: Yes, please!

[Atmosphere gives Plant a handful of CO₂ molecules.]

Plant: Thank you, Atmosphere. Remember, I'll have some leftovers to give you soon.

Plant: [looks down at ground] One more ingredient for my breakfast. Hi, Water. Are you down there? I think I saw you raining from the sky yesterday.

Water: Hi Plant. Yup, I'm just resting here in the cool ground. Feel free to drink me up through your roots.

Plant: Thanks so much. Gulp. Gulp. Gulp. I'm going to send this water through my stems into my leaves where the cooking magic happens!

Plant: OK, time to mix these ingredients together. [Plant mixes ingredients and produces sugar.]

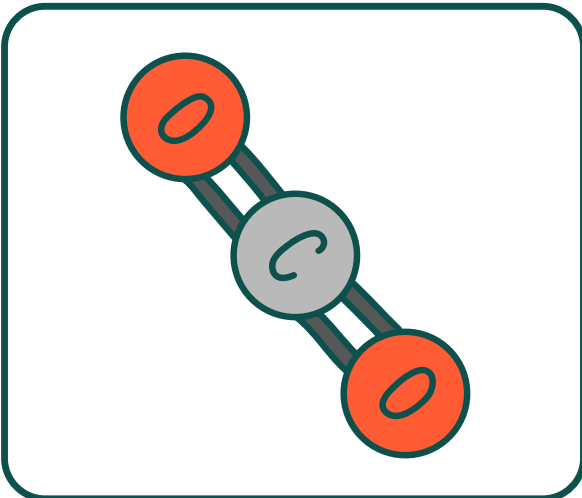
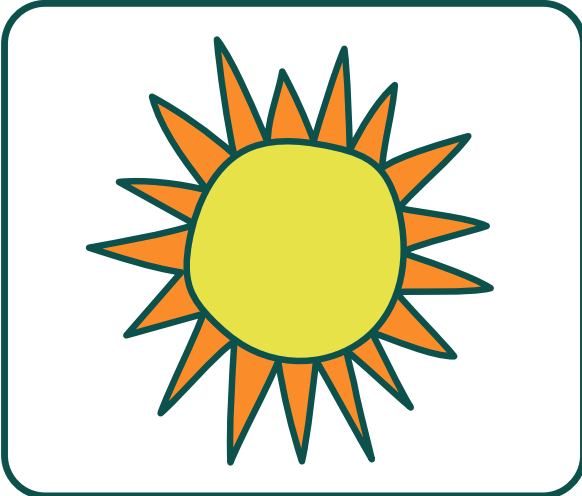
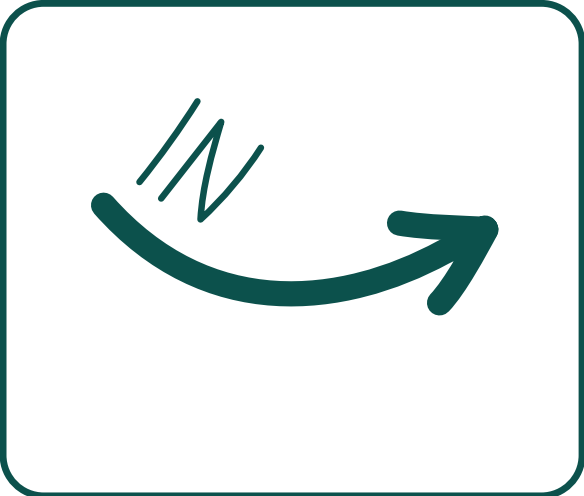
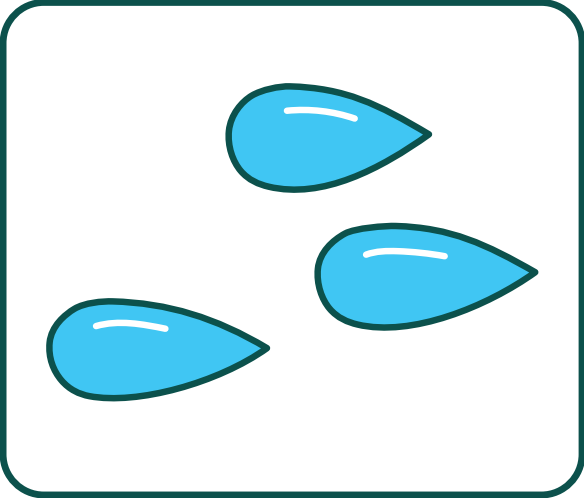
Plant: [to Atmosphere] Thanks for the carbon, Atmosphere, but I don't need this oxygen. Please share it with all the animals who live around here.

Atmosphere: My pleasure! Enjoy your breakfast.

[Plant eats the sugar it produced and grows one inch taller.]

Plant: Ahhh! Feeding myself takes some work, but I'm pretty lucky all the ingredients I need come from the sun, air, and water!

Photosynthesis Puzzle Kit

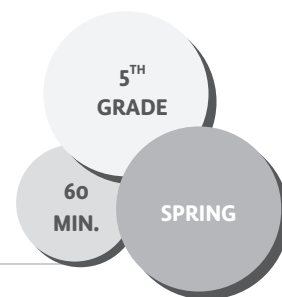


Photosynthesis



Seasonal Food Wheels

THEME: GROWING AND ACCESSING HEALTHY FOOD



ESSENTIAL QUESTION

How do we determine what and when to plant?

LEARNING OBJECTIVES

✓ Students will be able to interpret information from seed packets and growing guides.

✓ Students will be able to synthesize information to determine what can be harvested in their region each season.

LESSON DESCRIPTION

In this lesson, students sort seed packets according to plant parts and growing season and learn which fruits and vegetables are in season in their region. They then create their own Seasonal Food Wheel to inform when to harvest food plants grown in their USDA zone.

MATERIALS

- A collection of seed packets or printed copies of seed packets, including at least two examples of each plant part; suggested list:
 - Roots—Radishes, Carrots, Beets, etc.
 - Stems—Celery, Swiss Chard, Chives, Asparagus, etc.
 - Leaves—Spinach, Lettuce, Arugula, Collards, etc.
 - Flowers—Borage, Nasturtium, Broccoli, Cauliflower, Calendula, etc.
 - Fruits—Melons, Tomatoes, Eggplant, Cucumbers, etc.
 - Seeds—Sunflowers, Poppies, Pumpkins, etc.

For each student:

- Thick paper
- Seasonal Food Wheel Template (p. 422)

- Brass fastener (for fastening spinning arrow)
- For each group of 4–6 students:
 - Scissors
 - Glue
 - 1–2 seed catalogs

PREPARATION

- › Compile resources such as local planting charts for students to use when making their wheels.
- › Prepare a sample seed packet to project or a photocopy to pass out.
- › Prepare a full-year calendar to project or a photocopy to pass out.

ACTION STEPS

1. Engage: Say, *Today we're going to think about the different fruits and vegetables that grow each season in our area. What is growing and being harvested right now? (5 min.)*

2. Sorting Seed Packets by Plant Part: Hand out a seed packet to each student, and explain that when you give the signal, they're going to get up and group themselves according to which part of the plant we grow that crop for: roots, stems, leaves, flowers, fruits, or seeds. *For example, we grow carrots for the roots.* You can designate parts of the room to be meeting spots to add a bit of structure, or

let students communicate and problem-solve on their own for more of a team-building activity. Once they are sorted, call on students to share what plant they are and what part of the plant their team represents. Once you've shared at least one from each group, have students sit down. **(10 min.)**

3. Seed Packet Reading: Project or hand out a photocopy of a sample seed packet, and read the packet together as a class. Briefly go over the information they can find on the packet, such as planting time, optimal soil temperatures, and harvest date. Share with students your local USDA zone and average first and last day of frost temperatures for packets that rely on knowing that information. Project or hand out a full-year calendar for students to reference. As a class, determine in which season the sample seed would be grown, in which season it would be harvested, and then have students figure out the same for their own seed packets. **(10 min.)**

4. Seed Packet Harvesting Sort: Have students sort themselves again by plant parts. Once they're grouped, ask them to now sort themselves by the season in which they can be harvested. Go season by season, and ask a couple students to share what fruit or vegetable they are. Ask students, *Do you see any familiar faces from your plant part group in your season group?* Help students make a connection between the life cycle of a plant and the weather. Say, *Fruiting crops like melon and tomatoes need long periods of warm soil and high temperatures to produce fruit, but roots and leaves like carrots and spinach grow best in cooler temperatures.* **(10 min.)**

5. Explain the Activity: Tell students they're now going to make a seasonal food wheel, divided into the four seasons and depicting the crops that are harvested during that season. Show them your model, and show them the resources they'll use to create their own. Explain that they can cut out pictures from the seed catalogs, or they can draw. **(5 min.)**

6. Make Seasonal Food Wheels: Pass out art materials and resources, then circulate through the room, providing guidance and asking probing questions to check for understanding. Give students the option of cutting out an arrow and fastening it in the center to point at the current season. Then clean up before discussing reflection questions. **(15 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *Think about any gardens or farms you might have seen around here. What are the crops growing in our region right now? What are the crops that are currently harvested? What parts of the plant are growing right now? What parts of the plant will be growing next season?*
- *When we eat things that are not in season, how do we get them? What are the effects on the environment of eating fruits and vegetables when they are out of season?*
- *What was challenging about sorting yourselves into the different groups? What were strategies you found for making it easier? What tips would you give someone for reading a seed packet?*

ADAPTATIONS

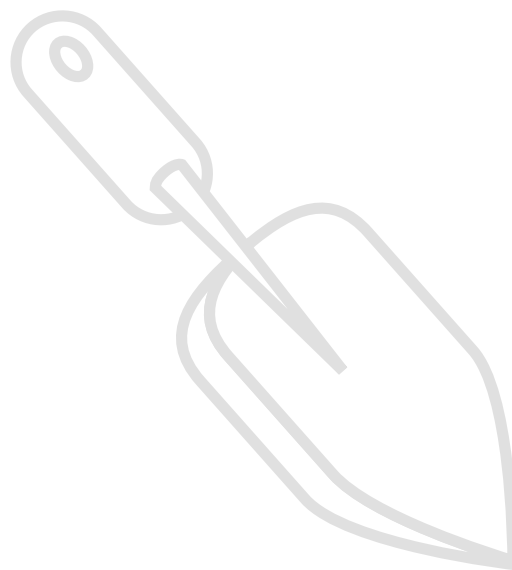
Cooking Extension: Have students choose a season and, using their wheel, create a menu centered around whatever is in season in your region.

ACADEMIC CONNECTIONS

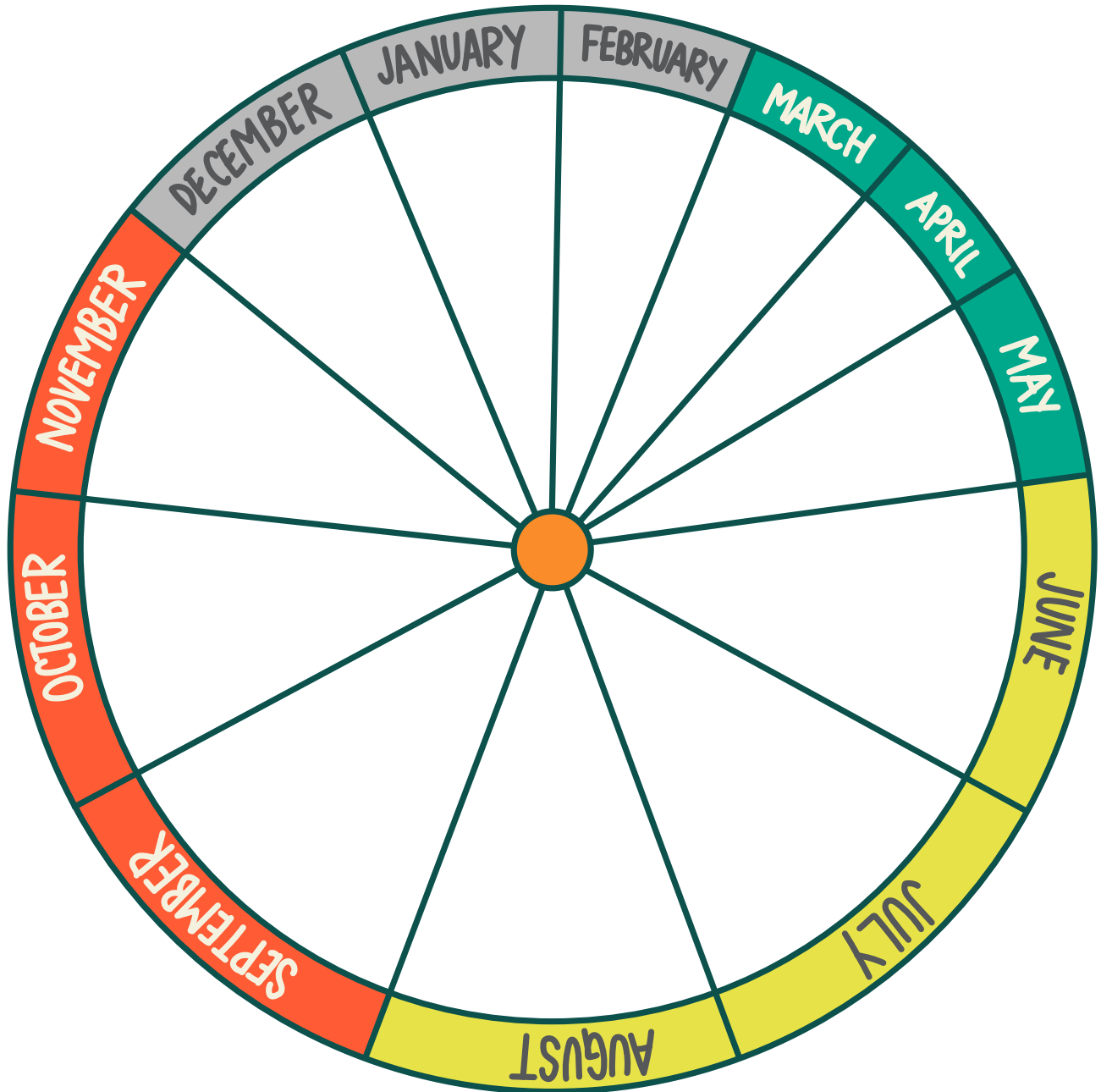
English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.RI.5.7

Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.

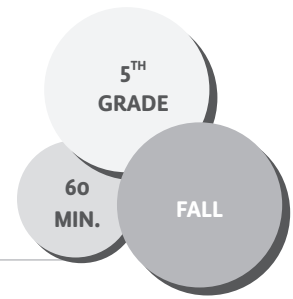


Seasonal Food Wheel Template



Green Sauce Around the World

THEME: PREPARING HEALTHY FOOD



ESSENTIAL QUESTIONS

How do different cultures use similar building blocks to create flavor in their foods?

How do we effectively balance flavors in a sauce?

LEARNING OBJECTIVES

✓ Students will be able to explain how people use similar foundational flavors across cultures.

✓ Students will be able to apply their understanding of balancing flavor profiles to a green sauce.

LESSON DESCRIPTION

In this lesson, students study five different green-herb sauce recipes from various cultures and determine their commonalities and differences. The class then works together to create and enjoy one of these simple green sauces.

MATERIALS

- Printed Recipe Cards (p. 427) for five different green sauces (sauces made from green herbs)
- Ingredient Investigator Role Cards (p. 426)
- Blank Green Sauce Recipe Cards (p. 428)
- 6 red, yellow, green, blue, and purple pencils or highlighters for marking up recipes
- Ingredients to make a simple green sauce (see ingredients listed in recipes at the end of this lesson)
- Large *molcajete* (mortar and pestle) or a blender
- 4–6 small bowls
- Pita bread or crackers for tasting
- Materials for cleanup

PREPARATION

- › Choose which green sauce you'd like to prepare with your class. Consider which sauce might feature produce you have available in your school garden or locally, or which might be the most culturally and/or regionally relevant to your students.
- › Set up a cooking station in the room where groups of 4–6 students can gather.
- › Photocopy and cut out Ingredient Investigator Role Cards, so there's a card for each student in each group.

BUILDING BLOCKS FOR GREEN SAUCE

ALLIUM FAMILY	LEAFY HERBS	FATS	ACIDS	SPICES	OTHER
<ul style="list-style-type: none"> • Garlic • Onion • Shallots 	<ul style="list-style-type: none"> • Parsley • Cilantro • Basil • Lemon-grass • Oregano 	<ul style="list-style-type: none"> • Olive oil • Nuts • Cheese 	<ul style="list-style-type: none"> • Vinegar • Lemon • Lime 	<ul style="list-style-type: none"> • Salt • Pepper • Peppercorns • Coriander • Cumin • Crushed red pepper • Thai chili pepper • Cayenne 	<ul style="list-style-type: none"> • Bell peppers • Tomatoes • Galangal

SAMPLE SCOREBOARD

SAUCE	HAS GARLIC	HAS THE MOST SPICES
Chermoula	X	
Green Curry Paste	X	X
Sofrito	X	
Chimichurri	X	
Pesto	X	

ACTION STEPS

1. Sharing Favorite Sauces: Divide students into five groups. They will work in these groups for the entire lesson. Begin by asking students to describe (in small groups) their favorite sauce. Provide some examples, such as soy sauce, ketchup, hot sauce, etc. Say, *Be sure to tell your group why this sauce is your favorite, any ingredients you know, and (if you know) what country it comes from. After everyone in your group has shared, look for common themes, and have someone prepare to share with the whole class.* After a couple minutes of small group discussion, ask a volunteer from each group to share the commonalities they noticed. You might have a student take notes on the board or chart paper. Say something like, *Sauces are a way to add a contrasting flavor to a dish. People like ketchup with french fries because it adds something sweet to something salty. Today we're going to be looking at different sauces from around the world that use green herbs as their foundation.* **(5 min.)**

2. Studying Ingredients: Explain that you're going to give a green sauce recipe to each group to study. Say, *You're all going to be ingredient investigators, and we're going to get to the bottom of what makes these recipes similar and what makes them different. Each person in the group will be on the hunt for a different type of ingredient and will mark up the recipe based on their role.* Provide each team with recipes for different green sauces, Ingredient Investigator Role Cards, and highlighters or colored pencils. **(5 min.)**

3. Ingredients Around the Room: Tell students that in this next activity they're going to

represent their recipe. Explain that one side of the room will be "yes," and one side will be "no." You'll have a representative from each group stand in the middle of the room, and you'll ask whether their recipe contains a particular ingredient, and they'll have to move to the yes or no side. If they're unsure, they can stay in the middle and have a teammate help them. Play a few rounds, switching out the representatives for each team. Ask questions such as, *Does your recipe have cilantro? Does your recipe have garlic? Does your recipe contain a hot spice? Does your recipe contain a fat?* Have a student keep a scoreboard for the class on chart paper or on the board so that you can refer to it during the following discussion. **(10 min.)**

4. Discussing Observations: Ask students for their observations, *What do the recipes seem to have in common? What else do you notice?* Explain, *Herbs pack a powerful punch, so they're a perfect ingredient to flavor other milder foods, but you wouldn't necessarily eat herbs just on their own, so we use fats and acids and spices to balance the flavors. It seems around the world, people understand that eating green foods, rich in chlorophyll and vitamins and minerals your body needs, is good for you.* Share with students what the different recipes have traditionally been eaten with. For example, chimichurri is meant to compliment steak in Argentina, and chermoula is often served with grilled seafood in Morocco. Explain that one sauce might be saltier, creamier, or spicier depending on which food it is meant to accompany. **(5 min.)**

5. Wash Hands Break! (5 min.)

6. Passing the Molcajete: Explain that all these sauces are prepared the same way in Mexico—by

mashing the raw ingredients into a sauce or paste using a mortar and pestle, or *molcajete*. Show students your tool, and demonstrate how to use it. Pass the empty *molcajete* around, explaining, *In fact, the word pesto comes from the Italian verb pestare meaning to pound or crush. Garlic is a potent plant part we call an aromatic. When we crush these aromatic ingredients, like garlic, we are breaking down the plant's cells walls, and they release their strong aroma and flavor.* (5 min)

7a. Creating Recipe Cards: Pass out recipe cards to students. Have them work with their groups to create their own green sauce recipe, incorporating different elements from the recipes they studied.

7b. Making Sauce Together: While students are creating their own recipes, call up one group at a time to help make the sauce. For example, one group can peel and smash garlic with coarse salt. Another couple of groups can pick herbs and incorporate them into the sauce. The next group can incorporate spices, and the final group can slowly drizzle in the olive oil. (15 min.)

8. Tasting: Divide the sauce into smaller dipping bowls for each group of four to six students, and have a student pass out a couple crackers or piece of bread to each student. Encourage students to discuss the balance of flavors they taste in the sauce in their groups. (5 min.)

REFLECTION

Have students discuss the following questions in small groups, then share with the class: (5 min.)

- *Why do you think the ingredients in your group's recipe would be used in that particular part of the world?*

- *How can you incorporate one of these sauces into something you eat at home?*
- *How would you describe the flavors in the sauce we prepared?*
- *What techniques did you find best for working with the mortar and pestle?*

ADAPTATIONS

Alternative Approach: If you have the resources, you might have each group make a different recipe, so students can taste the differences between the recipes.

Garden Setting: Make a green sauce based solely on what you can harvest in the school garden in the fall.

At Home: Have students bring home their customized recipe to make with their caregivers.

Research Extension: Have groups each research their recipe's country of origin, studying the climate and culture to better understand why certain ingredients might be used in that region. This connects well with the forth grade lesson *Mealtime Traditions Around the World*.

ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.SL.5.1

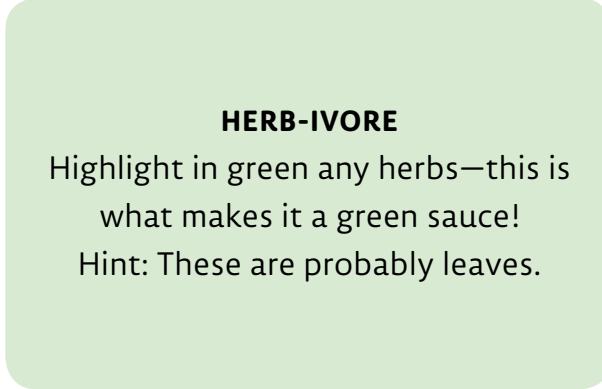
Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 5 topics and texts*, building on others' ideas and expressing their own clearly.

Ingredient Investigator Role Cards

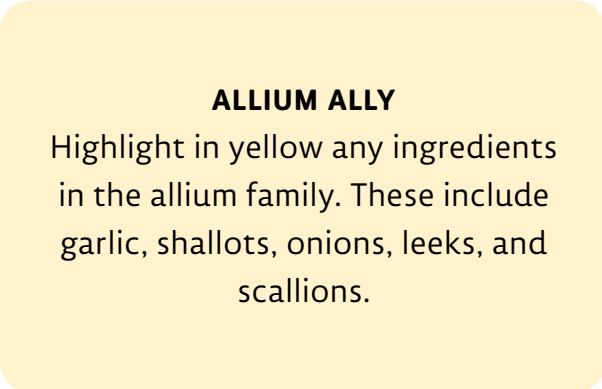


Cut out the following to give to each student in a group:



SPICE SLEUTH
Highlight in red any spices. These include basic spices like salt and pepper, to bolder ones like cayenne!



HERB-IVORE
Highlight in green any herbs—this is what makes it a green sauce!
Hint: These are probably leaves.




ALLIUM ALLY
Highlight in yellow any ingredients in the allium family. These include garlic, shallots, onions, leeks, and scallions.



FAT FINDER
Highlight in blue any ingredients that add fat to the sauce. These include oils, nuts, and cheeses.



SOUR SEEKER
Highlight in purple any acid ingredients that add a sour or acidic flavor. These include vinegars and citrus fruits.



Recipe Cards

Green Sauces Around the World

Note: These recipes provide students insight into more unique ingredients used in different cultures, but these ingredients may be difficult to access. Adapt and substitute where needed.

Sofrito - Caribbean

- 2 medium green peppers, seeds removed
- 1 red sweet pepper, seeds removed
- 2 large tomatoes
- 2 medium onions, peeled
- 1 head of garlic, peeled
- 1 bunch cilantro leaves
- 1/2 bunch parsley leaves

Pesto - Italian

- 4 medium cloves garlic
- Generous pinch coarse sea salt
- 3 ounces basil leaves (from about a 4-ounce bunch)
- 2 Tbsp (30 grams) pine nuts (or other nut such as walnuts)
- 5 Tbsp (2 ounces) grated Parmigiano-Reggiano
- 1/2 cup plus 2 Tbsp extra-virgin olive oil

Chermoula - North African

- 1 cup packed cilantro leaves
- 1/2 cup packed parsley leaves
- 4 medium cloves garlic, peeled
- 1/4 cup preserved lemon juice or 1/3 cup regular lemon juice
- Tbsp paprika
- 2 tsp ground cumin
- 1/2 tsp cayenne
- 1/8 tsp crushed saffron (or substitute ground turmeric)
- 1/2 cup olive oil
- Kosher salt, to taste

Green Curry Paste - Thai

- 1 Tbsp sliced cilantro roots
- (or handful of cilantro)
- 1 Tbsp coriander
- 1/2 Tbsp cumin
- 1 1/2 Tbsp galangal (or ginger)
- 1/4 cup garlic
- 1 kaffir lime (or regular lime)
- 3-4 Tbsp sliced lemongrass
- 1/2 tsp freshly ground peppercorns
- 1 Tbsp kosher salt
- 1/2 cup sliced shallots
- 1 tsp shrimp paste
- 1/4 cup chili leaf (optional)
- 10–15 green Thai chili peppers (or other spicy pepper)

Chimichurri - Argentinean

- 1/4 cup chopped parsley
- 3 Tbsp red wine vinegar
- 4 large garlic cloves, minced
- 2 Tbsp oregano leaves
- 2 tsp crushed red pepper
- Kosher salt and freshly ground pepper to taste
- 1/2 cup extra-virgin olive oil

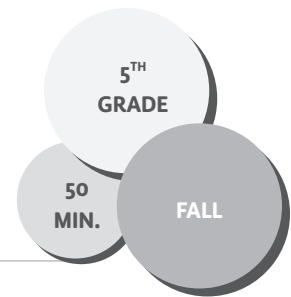
Blank Green Sauce Recipe Cards

GREEN, LEAFY HERB _____	SPICES _____	DIRECTIONS _____
FAT (oil, cheese, etc.) _____	ACID _____	
ALLIUM (garlic, onion, etc.) _____		

GREEN, LEAFY HERB _____	SPICES _____	DIRECTIONS _____
FAT (oil, cheese, etc.) _____	ACID _____	
ALLIUM (garlic, onion, etc.) _____		

Putting the Garden to Bed

THEME: GROWING AND ACCESSING HEALTHY FOOD



ESSENTIAL QUESTION

How can we prepare the garden for winter?

LEARNING OBJECTIVES

- ✓ Students will be able to explain why we allow the garden to rest at certain times of the year.
- ✓ Students will be able to prepare the garden for winter.

LESSON DESCRIPTION

In this lesson, students explore the garden for signs of the changing season and learn techniques for putting the garden to bed. They remove warm-season crops, plant cover-crop seeds, and explore the differences between cold- and warm-weather seeds.

MATERIALS

- Seasonal Changes: Observations Worksheet for each student
- Cover-crop seed appropriate for your region
- Enough trowels or hand cultivators for each student at your Plant Cover Crops station
- 1 bucket for trowels or cultivators
- Cold-hardy seeds appropriate for your region (e.g., seed garlic, fava beans, or greens)
- 2–3 clippers
- 8–12 cold- and warm-weather seed packets for seed matching activity (see Preparation below)
- 8–12 Small clear bags or baby food jars to store seeds for matching activity
- Wheelbarrow or a couple 5-gallon buckets for carrying debris to the compost pile
- Wire for making cloche bed in Adaptations

PREPARATION

- › Photocopy Seasonal Changes: Observations Worksheet for each student
- › Identify cover crop and/or cold-hardy seeds appropriate for planting in the fall in your climate. Depending on your climate, good cover crop options might include clover, fava beans, peas, or vetch. These are often available at low prices in bulk bins at garden centers.
- › Clear and prepare one garden bed in which students in the first station rotation will be able to plant cover crops. Then make sure that students in the second rotation can plant cover crop into a bed cleared during the first rotation and so on.
- › Identify garden bed(s) with summer annual plants for students to harvest from and clear.
- › Gather burlap bags, straw, or tarp for beds that won't be cover cropped or planted in right away.
- › Prepare seed matching activity. This is a good way to use up old seeds that are no longer viable. Empty each seed packet into its own container, such as a small jar. If possible, laminate various seed packets, or put them into sheet protector sleeves. Be sure to have a variety of cold- and warm-weather crops.

ACTION STEPS

1. Discussion: Gather students in a circle and ask, *Why do we go to sleep at night?* Field responses from students. Explain, *The garden is similar to us. It gets depleted if it remains actively growing all year. We can put it to rest for the winter a few different ways. Just as we put on a blanket at night, we can put a living blanket over our garden by using what we call a cover crop.* Ask, *How do you think the cover crop or blanket of plants helps the soil in the garden over the winter?* **(5 min.)**

2. Explore the Fall Garden: Say, *We're going to observe the ways the garden is already going to bed on its own.* Have students go out and explore the garden, looking for how different plants are responding to the winter. If time allows, give them a few minutes to record observations on the Seasonal Changes: Observations Worksheet. Then ask, *What are the signs that the season is changing and that our plants are responding to that change?* Invite students to share, and add in any of the following if it doesn't come up: as the days get shorter and the temperature drops, some plants drop leaves, and others wither, die, and ultimately, decompose. In the soil, warm-season crops have used up a lot of the nutrients, and winter is a good time to put nutrients back into the soil. **(10 min.)**

3. Explain Rotations: Go over each rotation with students, explaining the activity and expectations at each station. Demonstrate how you'll indicate when it's time to rotate to the next station, and then divide students into groups. **(5 min.)**

4. Rotations: The following are possible rotations you could have students move through for this lesson, depending on your region, the status of your garden, your group dynamics, and how much additional adult support you have. **(25 min. total, about 8 min. per station)**

a. Harvesting and Removing Summer

Crops: Give students an example of a ripe crop that they can harvest. Have students harvest all that remains on the plant before pulling out the plant. Remind students to use two hands, and pull on the main stem as close to the soil as possible to effectively pull out the plant. Remind students to also shake or tap off the soil clinging to the root system to keep as much soil as possible in the bed. Discard old plants in the compost.

b. Planting Cover Crops: Gather students around the garden bed. Explain that cover crops are good for the garden because they help draw nutrients, such as nitrogen, from the atmosphere and pull it down into the soil. Then show students how to sow cover crops, explaining, *You'll be using the method of broadcasting the seed, which is a technique of scattering seeds across a large soil surface. You'll then rake the soil to incorporate the seeds.* Pass out a small handful of seeds to each student, and have them sprinkle the seeds across the bed, being mindful of where others are scattering their seeds to achieve even coverage.



Then have a student distribute trowels or cultivators and demonstrate for students how to cover the seeds and rake the soil smooth. Finally, have students return their tools to the bucket, and gently pat the surface where they planted to ensure contact with the soil. Remind students not to use too much force because soil packed down too much doesn't hold water as well or give worms and other organisms all the air they need to thrive.

c. Seed-Matching Activity: Have students match jars of seeds to their respective seed packets. Then have them read the seed packet information to determine whether they could be planted during fall. Have them split the matched seeds into a warm-weather pile and cold-weather pile or in whatever way makes sense for your region. If time allows, invite students to draw a dream garden map for the spring featuring warm-season crops.

REFLECTION

Gather students together to discuss the following questions in small groups, then share with the class: **(5 min.)**

- *How long do you think it will be until we see the seeds we planted germinate (or sprout) from the ground?*
- *What plants did you identify in our garden that will survive the winter?*
- *Based on our seed-matching activity, are there any other cool-season crops we could still plant in our climate?*
- *What are the natural signs of the garden putting itself to bed that we observed?*
- *How did the work we did today benefit or help our garden soil?*
- *Ask yourself: Was I safe and helpful in the garden today?*

ADAPTATIONS

Planting Cold-Hardy Plants: Have students plant garlic, shallots, or other crops appropriate to your region to be harvested in the spring or summer.

Establishing a Cloche Bed: Explain to students that sometimes in the winter months we give our plants a real blanket made of fabric to insulate them from winter temperatures. Set up a cloche bed together by bending wire (such as steel pencil rod or clothesline wire purchased at a hardware store) into arches over your plants, then draping row cover cloth over the wire and attaching the cloth to the wire with binder clips or clothespins.

Singing: If you think your fifth graders will go for it, challenge groups of students to come up with a garden lullaby. Ask, *What song could we sing to the garden to help it know it's time to rest?*

Compost Variation: If your group doesn't have a compost pile, you can establish one using the FoodCorps Lesson "Break it Down" or through the method trench composting. Have students dig a 12-inch deep trench in an area of the garden where you won't be planting over the next year. Have students put their chopped green and brown materials into the trench, bury it with soil, and rake it smooth.

Food Preservation Extension: Have students make a preserve from the last harvest of warm-weather crops. For example, students could make a green tomato chutney using the green tomatoes from tomato plants they pull out and coriander from bolted cilantro plants.

ACADEMIC CONNECTIONS

Next Generation Science Standards, Life
Science Disciplinary Core Idea

NGSS LS2.A

Interdependent Relationships in Ecosystems

The food of almost any kind of animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. Some organisms, such as fungi and bacteria, break down dead organisms (both plants or plants parts and animals) and therefore operate as “decomposers.” Decomposition eventually restores (recycles) some materials back to the soil. Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem. (5-LS2-1)

Name: _____ Date: _____

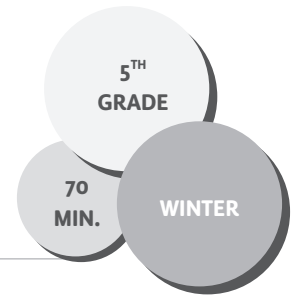
Seasonal Changes: Observations

Directions: Explore the garden and record evidence for how the plants are responding to seasonal changes in the table below.

Plant	Do you think it is alive or dead?	What is your evidence, or how do you know?
<i>Example: Tomatoes</i>	<i>Still alive, but dying</i>	<i>The leaves are mostly brown, but it still has some tomatoes growing on it.</i>

The Secret Strategies of Food Advertising

THEME: MAKING HEALTHY FOOD CHOICES



ESSENTIAL QUESTION

What influences our food choices?

LEARNING OBJECTIVES

- ✓ Students will be able to analyze food advertisements and identify marketing strategies.
- ✓ Students will be able to create persuasive advertisements for fruits and vegetables.

LESSON DESCRIPTION

In this lesson, students think critically about food advertising strategies, analyze a range of food advertisements, and create their own persuasive fruit or vegetable advertisement.

MATERIALS

- 5–10 food advertisements or food packages
- Nutrition labels for the same 5–10 foods
- Nutrition facts for 15 or more common fruits or vegetables that your students might be familiar with
- Paper for each student
- Markers and colored pencils
- Food Advertising Strategies Chart (p. 437)
- A chime or other noisemaker to indicate when it is time for students to rotate in the gallery walk (optional)

PREPARATION

- › Gather age-appropriate food advertisements that represent a diverse group of ethnicities from magazines or packaging, incorporating a wide range of food advertising strategies

from the chart below and ideally including one advertisement or package that is straightforward and accurate in its portrayal of the food. You may want to laminate them, mount them on thicker paper, or put them in sheet protectors to reuse.

- › Post food advertisements and packages in various locations throughout the room, each one paired with its associated nutrition label, where possible.
- › Project or post the following gallery walk reflection questions where all students can read them: *Who is the intended audience for this advertisement? What strategy is the advertisement using to persuade their intended audience to purchase their product? Do its claims reflect the information on its Nutrition Facts Label?*
- › Photocopy or prepare to project the Food Advertising Strategies Chart.

ACTION STEPS

1. Gallery Walk: Explain to students that today you'll be considering how food corporations market their products. Explain that you've posted advertisements around the room that you'd like them to observe and think about critically in pairs. Explain that they'll have one minute at each food advertisement to discuss the following guiding questions with their

partner: *Who is the intended audience for this advertisement? What strategy is the advertisement using to persuade their intended audience to purchase their product? Do its claims reflect the information on its nutrition facts label?* When the minute is up, they'll hear a bell and move to the next advertisement, traveling clockwise around the room. **(10 min.)**

2. Discussing: After the gallery walk, have students sit down and discuss the guiding questions as a class. **(10 min.)**

3. Marketing: Display the Food Advertising Strategies, and have students discuss examples they've seen of each, including television and internet ads. Discuss the concept of honesty with students. Ask, *Are any of these advertisements being completely honest?* **(10 min.)**

4. Explain the Activity: Explain that now that they understand how food corporations are marketing to kids to buy their products, students are going to create their own food advertisements. Say, *You can use the same strategies food corporations use to promote their products, or you can choose to be completely honest about your fruit or vegetable! You'll work in pairs to create a persuasive food advertisement for, let's say, strawberries.* **(5 min.)**

5. Making Garden Veggie Ads: Hand out nutrition facts for the fruits or vegetables they'll be promoting. Have students work with partners to create an advertisement for the fruit or vegetable they got. You can focus everyone on making visual advertisements, or give the option for theatrical ones as well. Circulate through the room, and check in with students, asking clarifying questions. Give students a

three-minute warning before asking them to clean up. **(20 min.)**

6. Sharing: Create a second gallery walk with their advertisements. Have students place their finished work on their desks for classmates to walk around and observe. After everyone has seen each other's work, have students sit down, and have them (those who choose to) create a theatrical advertisement to perform. **(10 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *How has considering food marketing influenced your thinking about food?*
- *What were the differences between the class's veggie advertisements that were completely honest versus those that used marketing strategies? Which was more persuasive to you?*
- *Why do you think companies work so hard to market foods?*
- *If you want accurate information about food, where can you get it?*
- *How did it feel creating your own food advertisement? What strategies did you use?*

ADAPTATIONS

Extension: Have students note and record every food advertisement they see in one day.

ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.RI.5.7

Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.

CCSS.ELA-LITERACY.RI.5.5

Compare and contrast the overall structure (e.g., chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in two or more texts.

CCSS.ELA-LITERACY.L.5.5

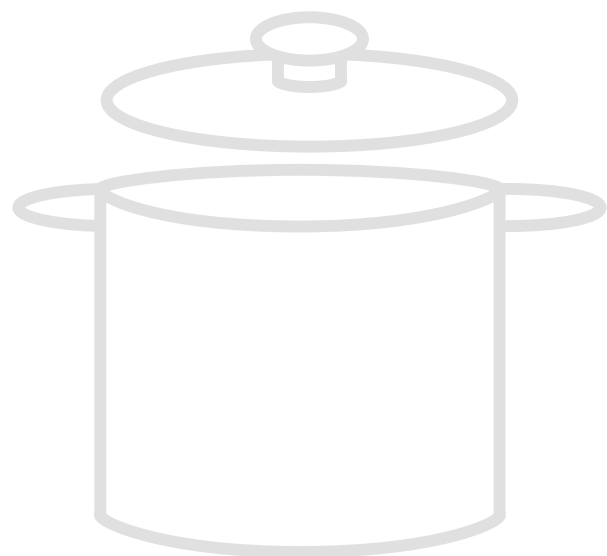
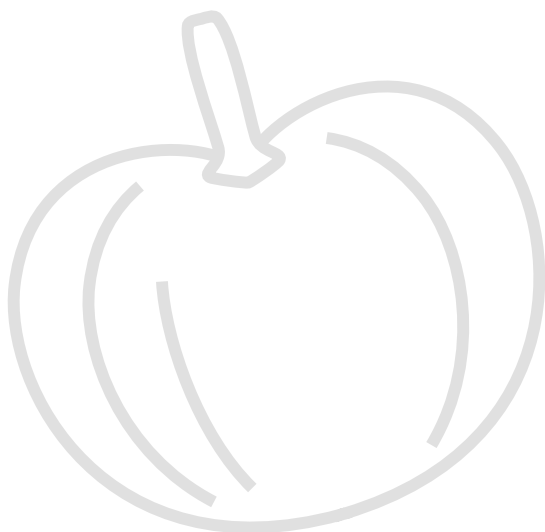
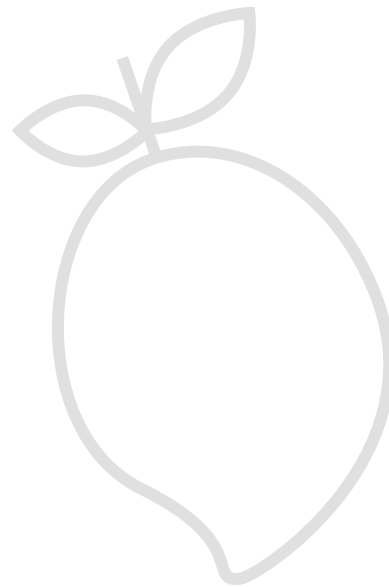
Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.

CCSS.ELA-LITERACY.L.5.3

Use knowledge of language and its conventions when writing, speaking, reading, or listening.

CCSS.ELA-LITERACY.RI.6.8

Trace and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and evidence from claims that are not.



Food Advertising Strategies

COOL FACTOR

The ad makes it look like you're really cool if you use the product.

CARTOON CHARACTERS

There's a cartoon character who you identify with the product.

HEARTWARMING

Kids and families in the ad look perfect, and/or people are sharing a sweet moment, making it seem the product brings them together.

CELEBRITIES

Sports or TV stars are paid to promote the product.

SNEAKY LANGUAGE

Advertisers try to make their products seem healthier than they are with words like "all natural" or "part of a balanced breakfast."

INSULTS

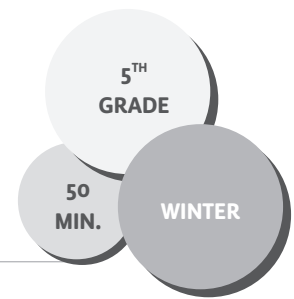
Advertisers put down the competition to make their product look superior.

FACTS AND FIGURES

The ad includes statistics like "95% of people who used..." to make their product's value seem more believable.

Web of Life

THEME: EXPLORING THE ECOLOGY OF FOOD



ESSENTIAL QUESTION

How are all living creatures connected?

LEARNING OBJECTIVES

- ✓ Students will be able to explain the interdependence of plants and animals.
- ✓ Students will be able to demonstrate how energy is transferred between living things.

LESSON DESCRIPTION

In this lesson, students consider the interdependence and transfer of energy between living things by creating food chains and participating in a yarn food web activity.

MATERIALS

- One set of Food Web Role Cards (pp. 441–444)
- Yarn or string
- Tape
- Play dough (or a piece of bread or paper)

PREPARATION

- › Photocopy and cut apart the Food Web Role Cards.
- › Set aside the following cards for your demonstration of food chains:
 - › Simple chain: sun, carrot, human
 - › Complex chain: sun, carrot, slug, chicken, coyote, bacteria

ACTION STEPS

1. Engage: Gather students in a circle and ask students to perform a simple physical activity such as running in place. Ask, *What do you need so you can do that?* Once students say, “energy,” ask, *Where did you get that energy from?* Once students answer “food,” say, *Of course! We get energy from the food we eat.* Ask for a volunteer to tell you what they ate that day that gave them energy. Then walk students through the chain of that food. For example, *If you had a glass of milk, where did the energy in the milk come from? (Cow!) Where did the energy in the cow come from? (Grass!) Where did the energy in the grass come from?* Remind students that green plants are the only living things that can make their own food or energy from the sun. **(5 min.)**

2. Demonstrating a Food Chain: Pass out several Food Web Role Cards that would make a food chain. Start with a simple one of a human eating a vegetable, such as sun, carrot, and human. Have the sun give the carrot a piece of play dough, and explain that it represents the energy from the sun that the carrot stores. Now tell the class that only 10 percent of the energy that the carrot gets from the sun is passed on. Have the carrot break off one-tenth of the play dough, and pass it to the human. Next, demonstrate a more complex

food chain, for example, the sun, carrot, slug, chicken, coyote, and bacteria. Have those students stand up and order themselves with the class's help. Check for understanding by asking students how they know. Again, have the sun pass a big hunk of play dough to the corn, but this time the corn passes 10 percent to the slug, and the slug passes 10 percent of that to the chicken, and so on, so that just a teeny speck is being passed. **(10 min.)**

3. Explain the Activity: Explain, *We just created a food chain, but now we're going to create a food web to see the interdependence of many plants and animals on one another and how the sun's energy gets passed. Interdependence means how different plants and animals depend on one another.* Pass out the rest of the Food Web Role Cards and tape, and have students affix their role card prominently to their shirts. **(5 min.)**

4. Identifying Producers, Consumers, and Decomposers: Have students stand in a circle, and to ensure that students understand their role and place in the food chain, go through a few rounds of identifying the various groups represented. Say, *If you can make food from sunlight, take two steps forward. You're the plants, or producers! If you are an animal that eats plants and/or animals, take two steps forward. You're consumers! If you help break down dead plants and animals, take two steps forward. You're decomposers!* Do several rounds, and have students help each other figure out if anyone should have stepped forward who didn't. **(5 min.)**

5. Making a Yarn Food Web: Have the sun stand in the middle of the circle with the ball

of yarn. Explain, *The sun must pass its energy to someone who can receive it, and then that person must pass the yarn to someone who can receive it. In other words, you pass the ball to someone who can eat you! So, if the ball gets passed to you, hold a piece and then pass the ball to someone who you can give your energy to.* Keep the chain going as long as you can, and then cut the yarn, and pass it back to the sun to start a new chain. Keep going until all students are holding at least one piece of yarn. **(15 min.)**

6. Discussing: Ask students to think of scenarios that would affect the food web (e.g., a drought or deforestation). Discuss these hypothetical scenarios, and have students tug on the string if they would be directly affected. Ask who felt the tug, and then have those students tug on the string. Try it out with some positive scenarios too, such as a farmer feeding compost to the plants to make them healthier. Discuss how an event that affects one living creature in the food web eventually affects other living creatures that rely on it. **(5 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *Why is it important to have a diverse food web with many different plants and animals in it?*
- *How did the yarn food web activity affect your thinking about plants and animals around you?*

ADAPTATIONS

Garden Setting: Have students bring out clipboards and paper, and make a list of every living thing they observe in the school garden, from insects, to plants, to birds flying overhead and squirrels in the trees. Then have students make role cards for these creatures, and create a yarn food web for the garden.

ACADEMIC CONNECTIONS

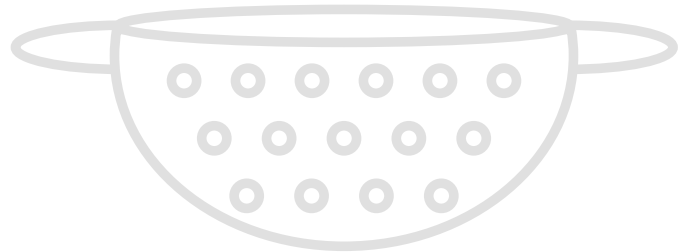
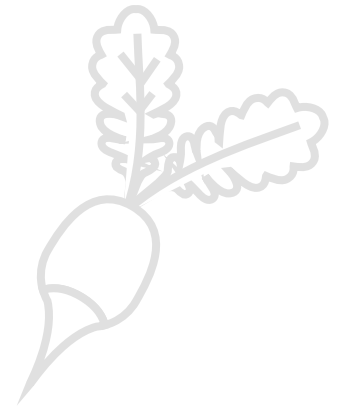
Next Generation Science Standards, Life Science Disciplinary Core Idea

NGSS 5-PS3-1.

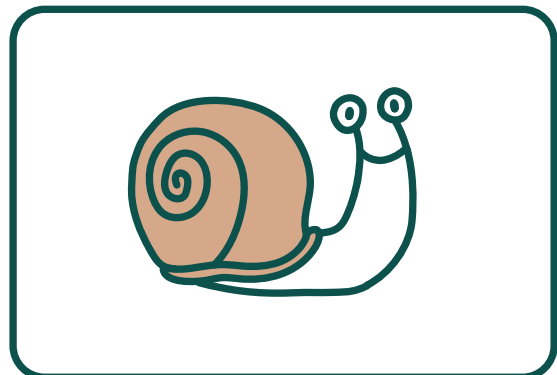
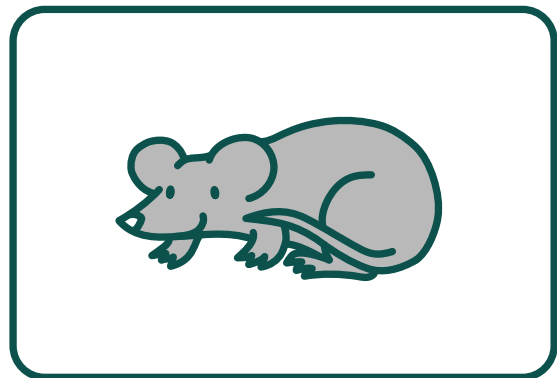
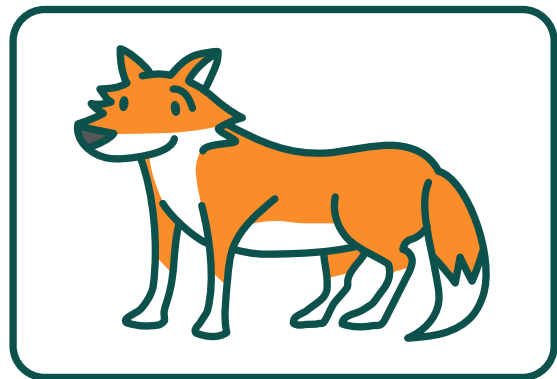
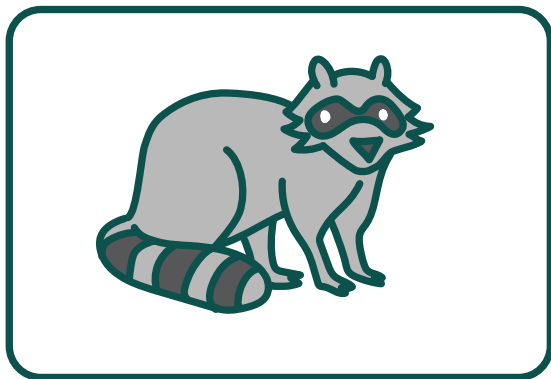
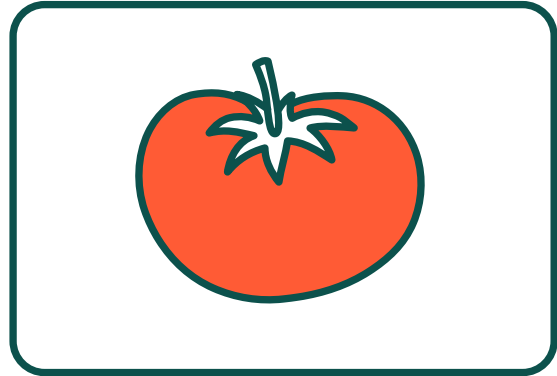
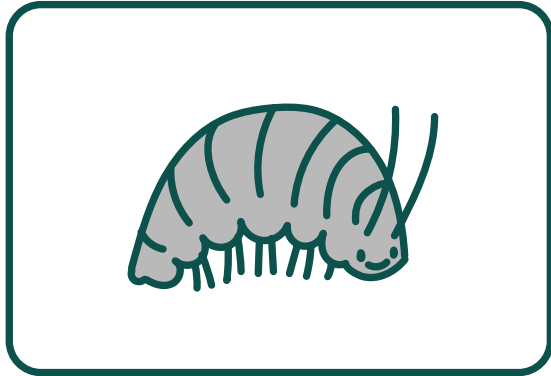
Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.

NGSS 5-LS2-1.

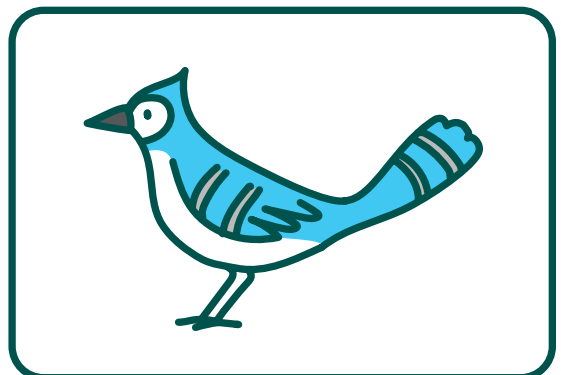
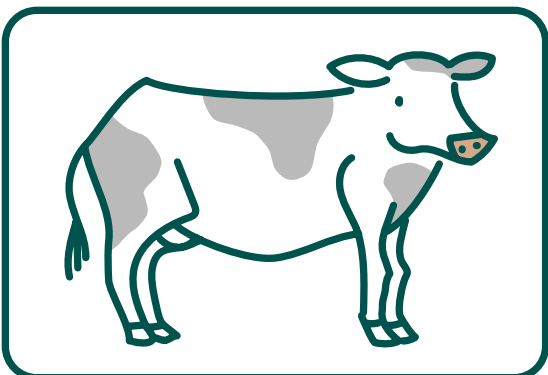
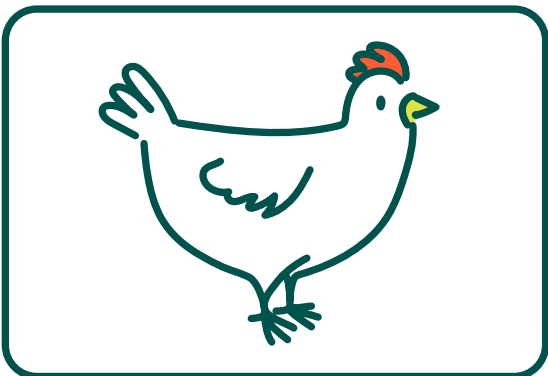
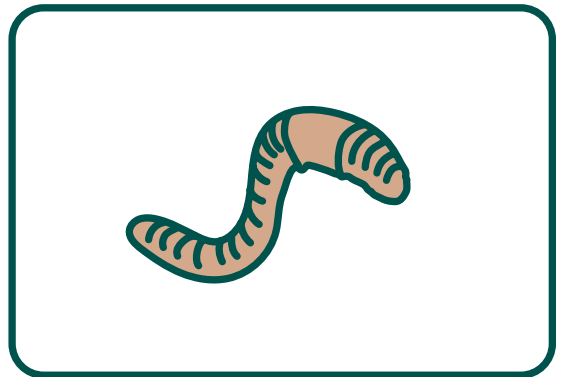
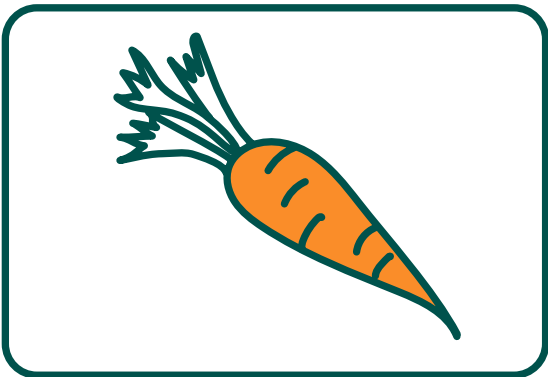
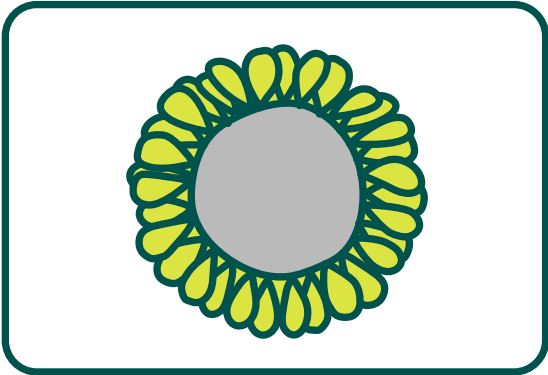
Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.



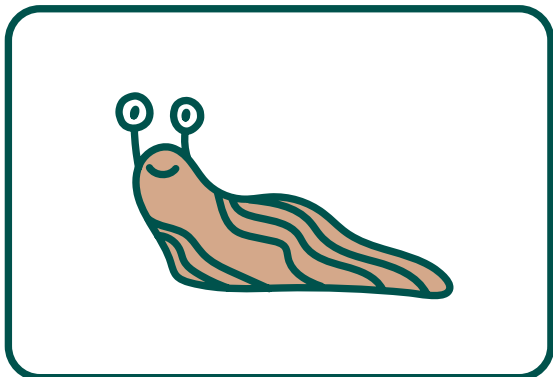
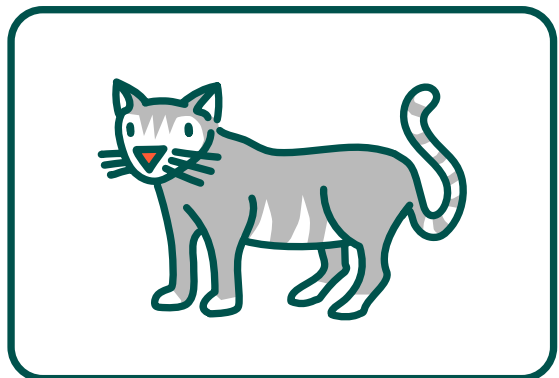
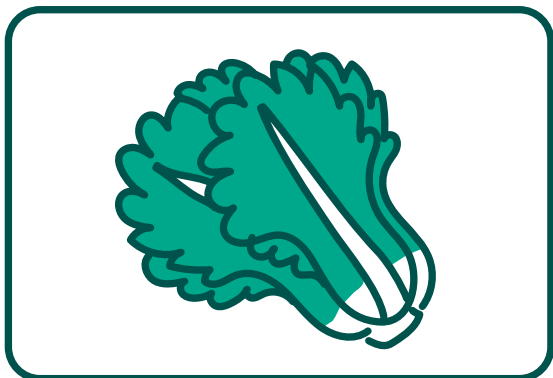
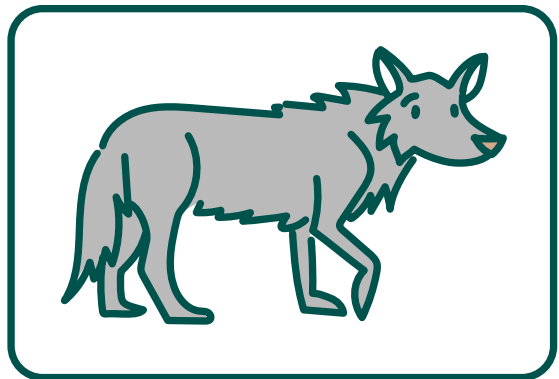
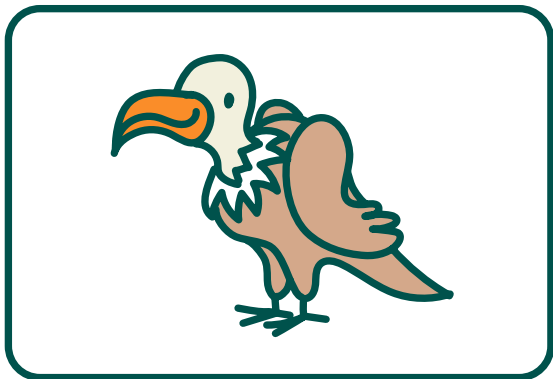
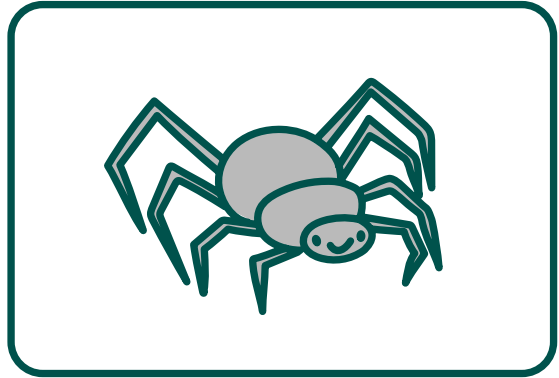
Food Web Role Cards



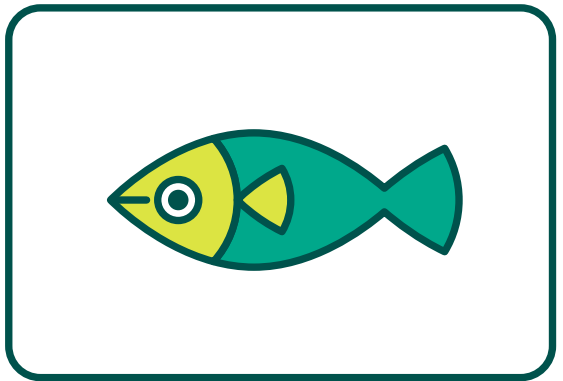
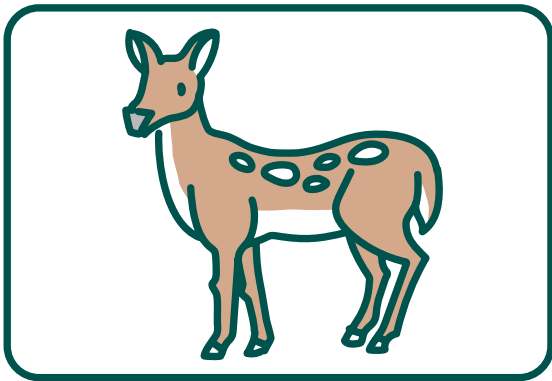
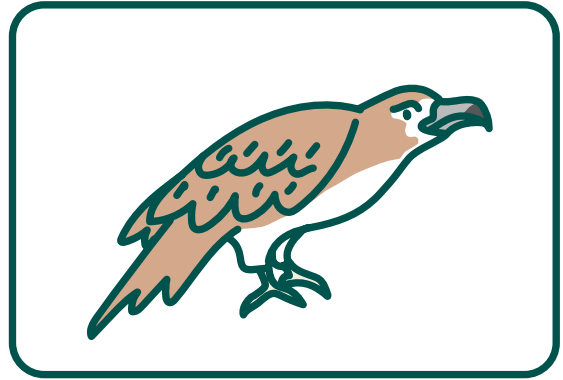
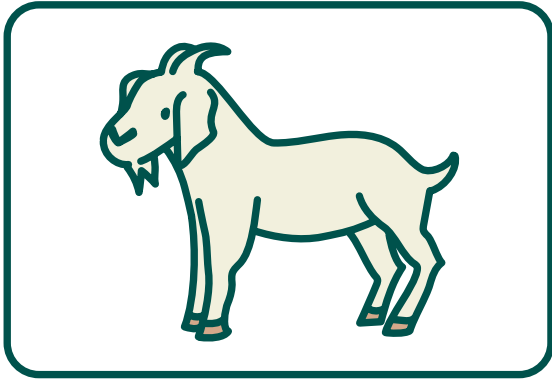
Food Web Role Cards



Food Web Role Cards

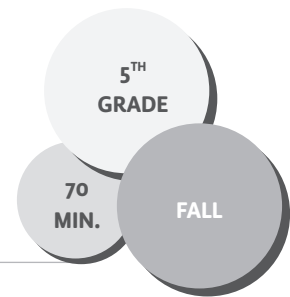


Food Web Role Cards



Changemakers

THEME: GROWING AND ACCESSING HEALTHY FOODS



ESSENTIAL QUESTION

How can we be agents of change within our community?

LEARNING OBJECTIVES

- ✓ Students will be able to identify problems in their community and suggest possible solutions.
- ✓ Students will know that they can create change.

LESSON DESCRIPTION

In this lesson, students hear about an activist who addressed a sustainability issue within their community. They'll then brainstorm issues within their own community and work in teams to generate solutions and action steps they could take to be agents of change. This lesson is a springboard for student-initiated projects, and it is ideally led with significant input and support from the classroom teacher. It is important to have a plan for supporting students after the lesson with opportunities to take action on the projects they design, such as in a subsequent class period or during a lunchtime club when students can work together on letter-writing campaigns, posters for the school, or the like.

MATERIALS

- Computer and overhead projector
- Chart paper
- Tape
- Markers

- Action Steps and Outcomes Worksheet (p. 449)
- Action Plan Worksheet (p. 448)
- Kitchen timer

PREPARATION

- › Visit the Brower Youth Awards website, and browse its list of awardees to find a video to share with your students, such as the video about Maya Salsedo who addressed issues she saw with the food system by creating a Youth Food Bill of Rights and mobilizing other youth to get involved. Alternately, if you know a youth in your community who has led a successful service-learning project or community initiative, invite them to talk with your students!
- › Write the following Margaret Mead quote where all students will see it: "Never doubt that a small group of thoughtful, committed citizens can change the world; indeed, it is the only thing that ever has."
- › Hang chart paper throughout the room, labeling each with different issues that relate to food systems that might arise in their community: Access to Healthy Food; Habitat for Pollinators; Food Waste; Food Packaging and Recycling; Conditions and Pay for People Working on Farms, in Markets, or in Restaurants; Pollution; and Other.

ACTION STEPS

1. Real-Life Story: Share with students the following quotation by Margaret Mead: *“Never doubt that a small group of thoughtful, committed citizens can change the world; indeed, it is the only thing that ever has.”* Ask them to discuss in pairs and share: *What does this quote mean to you?* Explain that you’ll be showing them a video of a student who embodies the spirit of that quote. Show students a video of a Brower Youth Award winner. Ask students for their impressions. Ask, *Do you think you and your peers could create change like that in this community?* **(5 min.)**

2. Freewriting or Drawing: Say, *I’m going to give you five minutes to think about your neighborhood and, specifically, about how people in your neighborhood get food. A neighborhood or community is its own ecosystem. We’re all connected, and different parts of the ecosystem can affect others positively or negatively. Imagine you’re flying over your neighborhood, seeing all the different parts of your community. What do you observe that affects what people in your neighborhood eat? Is there something you wished looked different? Describe or draw what you see and what you wish were different with as much detail as you can.* After five minutes, have students turn and talk to a neighbor and share as much as they feel comfortable sharing. **(5 min.)**

3. Brainstorming Issues: Show students that you’ve hung posters around the room highlighting big, global issues. Their task is to use the ideas from their freewrite to elaborate on how one or more of these issues show up in their community. If the issue they brainstormed

doesn’t fall under one of the categories, they can write it on the chart paper with the heading “Other”. Pass out markers and instruct students to add issues to the charts under the appropriate category. If students write issues unrelated to food, you can say, *I appreciate that we’re calling out so many things that make us want to be agents of change. For the purpose of this lesson, we’re going to postpone discussing topics that aren’t related to food, but that doesn’t mean you can’t take action on this individually.* **(5 min.)**

4. Gallery Walk: After students have written their issues, encourage them to walk through the room reading each chart and writing comments of affirmation or ideas for solutions next to other people’s ideas. Explain that they can also draw a star next to an issue to indicate that they agree. **(5 min.)**

5. Identifying Action Steps and Outcomes: Have students take their seats again and say, *That probably feels good to express some of those issues out loud, but we don’t just want to rant or complain. We want to figure out how we can do something about them.* Display the Action Steps and Outcomes Worksheet. Say, *Once we identify an issue, it’s important to figure out what we want to see happen instead. That would be our desired outcome.* Have pairs of students discuss the Brower Youth Award winner as an example. Have students identify the problem award winner saw, the steps they took, and the outcomes of their actions. **(5 min.)**

6. Whole-Group Practice: Have students share the problems they identified. Then select one of the problems from the chart paper to examine as a class. Ask students, *What would be your desired*

outcome? Make note of their responses, then ask, *What steps do we need to take to make that change happen?* Encourage students to think of concrete, immediate steps they can take. If students need guidance, you might ask, *What's causing this problem? Or Who in our school community needs to know about this problem?* But let the ideas for solutions come solely from students. You might want to introduce the concept of SMART goals, having small, measurable, achievable, realistic, and timely goals. **(5 min.)**

7. Sorting into Solution Teams: Tell students now that they've practiced together as a class, they'll have a chance to work on the issue they feel most strongly about. Have students self sort into teams based on the issue they're most interested in. Explain that when you give a signal, they'll get up and stand next to the chart paper that contains their issue. Give the disclaimer that there should be no more than four people in each group, and if they're not self-sorted after three minutes, you will help them find a group. If more than four students want to work on one issue, have them divide into multiple teams, each with up to four students. These teams can work on the same issue. Give the signal and set the timer. **(5 min.)**

8. Finding Solutions: Once students are settled into their groups, assign or have them self-select roles. Each group could have the following: a recorder to take notes, a time manager to keep the group on task, a facilitator to ask questions and make sure everyone's voice is heard, and a presenter to share information with the class. Have students determine the specific problem they'll be tackling. Then have them work together to fill out the Action Plan Worksheet. Say, *Make sure that everyone's voice in your group is heard. For instance, if you've just shared a lot about how*

you feel, it'd be nice to then ask someone on your team for their opinion. Circulate through the room, ensuring students are taking detailed notes, and all team members are getting air time. **(15 min.)**

9. Sharing Action Plan: Have each team report. Have team representatives share the issue they decided to work on and what action steps they determined would lead them to their desired outcome. **(15 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *How would the community benefit if we were to implement these changes?*
- *What strategies did your team use to hear from everyone?*
- *How did your group agree on how to approach your problem?*
- *Why is it important to consider your desired outcome for a problem before taking action?*

ADAPTATIONS

Classroom Extension: Have each team become an action group for their chosen issue. Have them meet once a week to check in on their progress toward their desired outcome using the Action Group Log (see p. 450).

ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.SL.5.4

Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.

Names: _____ Date: _____

Action Plan Worksheet

Directions: Fill out the following with your team.

The problem we chose is

We chose this problem because

Instead, we want to see

We believe what's causing the problem is

The first step we'll take is

The next step is







The next step is

We'll know we've made an impact when

Names: _____ Date: _____

Action Steps and Outcomes

PROBLEMS **ACTION STEPS** **OUTCOMES**

Names: _____ Date _____ Week: _____

Action Group Log

What have we accomplished since our last meeting?

What do we need to follow-up on?

What goals do we have this week?

Who do we need to contact or get support from this week?

What resources do we need?

TO DO:

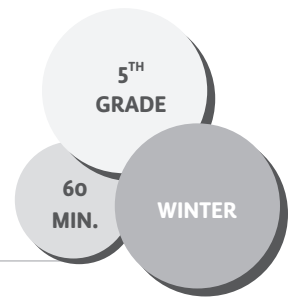
#1 _____ Who will do this? _____

#2 _____ Who will do this? _____

#3 _____ Who will do this? _____

Stone Soup

THEME: PREPARING HEALTHY FOOD



ESSENTIAL QUESTION

How do individual efforts contribute to a whole community?

LEARNING OBJECTIVE

✓ Students will be able to practice knife skills as they prepare vegetables for soup.

LESSON DESCRIPTION

In this lesson, students are each given a role to prepare and contribute something to a classroom stone soup. It is ideally intended as a celebration where parents or other adult community volunteers are present to assist.

MATERIALS

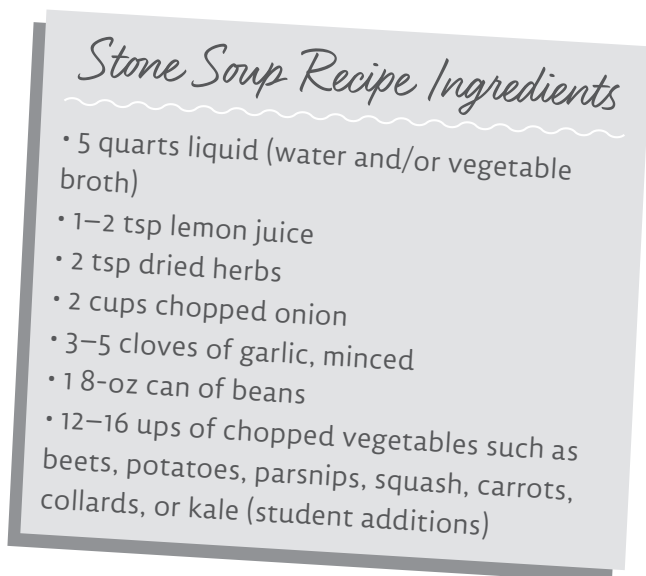
- *Stone Soup* the 2003 version by Jon J. Muth (emphasizes community and sharing)
- Smooth, clean stone
- *Stone Soup* Recipe Ingredients
- Induction burner
- Extension cord
- Stock pot
- Ladle
- Bowl and spoon for each student
- Bowls for food prep
- Flexible cutting mats
- Measuring cups and spoons
- Knives
- Containers for compost
- Paper and pencils
- Blank Recipe Cards for each student (p. 454)
- Markers
- Materials for cleanup

PREPARATION

- › Recruit other adults or volunteers to help supervise students prepping vegetables, while you are watching the soup pot. (It's ideal to start recruiting at least three weeks in advance, and it can be helpful to provide several reminders to your committed volunteers a day or two before the event.)
- › Find an appropriate location for this activity. The cafeteria will often work well for this.
- › Have a variety of vegetables so that groups of 2–3 students can prepare vegetables together.
- › Par boil (boil until soft but not until completely cooked) beets, carrots, or potatoes if you need to speed up in-class cooking time.
- › Roast winter squash, if using, beforehand.
- › Set up a demonstration cooking station for all students to see and access easily.
- › Prep the garlic and onions yourself, sautéing them until translucent, and then add broth and bring to a boil before class begins.
- › Set up stations with each ingredient already portioned on a cutting mat and ready for students to prepare. Have an empty bowl or container about the size that you'll want prepped.
- › Display your recipe where students can see, either on poster board, on the board, or projected.
- › Create role cards, 2–3 of each role, depending

on how involved the task is. For example: Tear collard leaves, juice one lemon, or scoop squash. Put the cards in a container for students to select at random.

- › Photocopy and cut blank Recipe Cards for each student.



STUDENT ADDITIONS

(FIRST ROUND)	(SECOND ROUND)	(THIRD ROUND)
Hard Vegetables	Soft Vegetables	Herbs and Seasoning
Beets	Collards	Parsley
Potatoes	Kale	Lemon juice
Parsnips	Chard	Salt and pepper
Carrots	Cans of beans	
Winter squash	Cans of tomatoes	
	Peppers	
	Frozen corn	

ACTION STEPS

1. Engage: Stand or sit in a circle. Explain that today the class will be making stone soup, showing students your stone. If they've heard it already, ask students to recall the story *Stone*

Soup. If they haven't heard it, read it aloud. Guide them to remember the theme that each person's small contribution in a community can add to a significant end result. **(5 min.)**

2. Explain the Activity: Tell students, *You'll each play a role in preparing the soup, and each person's contribution makes this soup tasty.* Explain that you'll hand out role cards, with two to three people sharing each role. Say, *It's important that you share the task, and make sure everyone with your job gets a turn.* Explain that when you call out for their ingredient, they should bring up the bowl of the prepared veggie and will have a chance to stir it into the pot. Remind them that the pot will be very hot, and ask them for ways to be safe. Then explain what they'll do with down time. Say, *When you're finished prepping your ingredient, you should clean up your spot, and then write the recipe to take home.* **(5 min.)**

3. Wash Hands Break! (5 min.)

4. Knife Safety Demonstration (5 min.)

5a. Preparing Veggies: Have students randomly select role cards and find their stations. The stations should be set up so that students need minimal guidance for preparing their vegetables. Call up students to deliver the vegetables during the appropriate time for cooking them. Try to make it fun and in keeping with the story *Stone Soup*. Say something like, *You know what this soup could really use is some squash. I wonder if anyone in the village has squash; or Hmm, I once had a stone soup with a little bit of lemon juice, and it was delicious.* When groups of students bring up their vegetable, allow them to pour it into the soup pot, and give each student a chance to stir. Try having students chant while

they stir: “One, two, cha, cha, cha, pass!” or Shakespeare’s “Double, double, toil and trouble, fire burn and cauldron bubble!” It doesn’t matter what they say, but that it makes it fun, limits their turn, and reminds them to pass.

5b. Writing Recipes: Once students have prepared and incorporated their ingredient into the cooking soup, have them write and decorate the recipe to bring home. **(Steps 5 and 6 combined take 20 min.)**

6. Cleanup: Taste and adjust the soup once all students have contributed. You may need to add more broth or more salt. While students are cleaning up their stations, portion the soup into individual bowls, and allow it to cool. **(5 min.)**

7. Tasting: Pass out bowls, and remind students to wait until you tell them to start eating. As you share your stone soup, reflect on the experience. **(10 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *Can you taste your prepared vegetable in the soup?*
- *What other vegetables would taste good in this soup?*
- *How would you change the recipe if you made it at home?*
- *What does the story Stone Soup tell us about community?*
- *What successes did you have working with your classmates? What challenges arose? What solutions did you find?*

ADAPTATIONS

At Home: Have students bring in recipes for their favorite soups to share with the class.

Garden Setting: If your garden is in full swing, try preparing a stone soup solely with what can be found in the garden.

ACADEMIC CONNECTIONS

(If reading *Stone Soup*)

English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.RL.5.7

Analyze how visual and multimedia elements contribute to the meaning, tone, or beauty of a text (e.g., graphic novel, multimedia presentation of fiction, folktale, myth, poem).



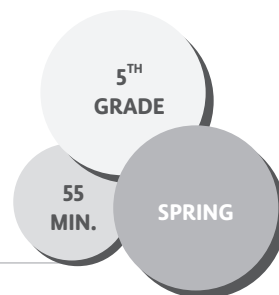
Recipe Cards

INGREDIENTS	STEPS

INGREDIENTS	STEPS

Sugar Showdown

THEME: MAKING HEALTHY FOOD CHOICES



ESSENTIAL QUESTIONS

Why is it important to consider the amount of sugar in what we eat?

How can we tell how much sugar is in a particular food?

LEARNING OBJECTIVES

- ✓ Students will be able to interpret a nutrition label to know how much sugar is in a product.
- ✓ Students will be able to explain the evolutionary reasons humans generally like sugar.
- ✓ Students will be able to prepare a healthy beverage.

LESSON DESCRIPTION

In this lesson, students estimate and measure the sugar content of commercially sold beverages and consider the implications of excess sugar in our diets as well as why humans like sugar. Then they sample an herb-and-fruit-infused water and think of variations they'd like to create at home.

MATERIALS

- Box of sugar cubes (or a bag of sugar)
- Paper towels
- Set of 5 nutrition labels for each group of 4–6 students
- Sugar Showdown Worksheet (p. 458) for each student
- Flavored Water Recipe Cards (p. 459) for each student
- Sugar Facts Worksheet (p. 460) for each pair of students
- Small cup for each student

- 2 ½ gallon glass jars (for doubling recipe; each recipe serves 15 small 4 oz. cups)
- Ingredients for infused water. The recipe below is just a suggestion. You can use cucumber, lime or other citrus, tropical fruits, basil, or other herbs to which you have access.
- Materials for cleanup

PREPARATION

- ▶ Print nutrition labels from the internet for a variety of sugary drinks, such as sodas, iced teas, energy drinks, flavored milk, fruit juice, etc. Pick items with which you think your students might be familiar.
- ▶ Prepare images of your selected drinks to display to the class. If you have access to an overhead projector in the classroom, simply project them in a slideshow. Otherwise, print a set of images for each group of students.
- ▶ Photocopy Sugar Showdown Worksheet.
- ▶ Create 1–2 fruit-and-herb-infused waters for students to try. See the recipe below as an example.

Berry- and Mint-Infused Water Recipe

- 1 cup berries, slightly crushed
- Handful mint leaves, muddled

Place mint leaves in ½ gallon jar and muddle (gently bruise with a wooden spoon). Add the crushed berries, and fill the jar with water. Allow the jar to sit in the fridge for four hours or up to overnight before serving.

ACTION STEPS

1. Guessing Sugar Content: Display images of sugary drinks. Show students a sugar cube. Explain the following: *Each sugar cube is a teaspoon of sugar. With your groups, you'll have to guess how many sugar cubes, or teaspoons of sugar, are in each of these drinks.* Pass out cubes and the Sugar Showdown Worksheet to each group of students. Have students work together to stack sugar cubes in front of the images of each beverage to show how much sugar they estimate is in each. After some time, ask a few students to share some of their group's estimates, explaining their justifications. **(5 min.)**

2. Measuring Sugar: Say, *I'm going to give you the nutrition labels that show the amount of sugar. One catch is that they're written in grams, so you'll have to know that each sugar cube has 4 grams of sugar in it. If a label says 24 grams of sugar, how do I figure out how many cubes that is?* (Divide by 4 to discover that 24 grams = 6 sugar cubes). *The other catch is that some containers have more than one serving in them. If there are 6 sugar cubes in 1 serving, and the container has 2 servings, how would I figure out the total number of sugar cubes?* (Multiply by the number of servings, so 6 cubes/serving x 2 servings = 12 sugar cubes in the container). Pass out nutrition labels to students. Have students match the labels to each of their beverages, use their handout to calculate the actual amount of sugar cubes in each drink, and update their stack of sugar cubes. Encourage students to stack their cubes vertically or into pyramids to enhance the visual impact. While they're working, create a stack of twelve sugar cubes. Once they're finished,

explain that *the American Heart Association has an even smaller daily maximum recommendation of 24 grams, or 6 sugar cubes, for women and children and 36 grams, or 9 sugar cubes, for men.* Have students work in small groups to compare these recommendations with the sugar in their beverages. **(15 min.)**

3. Deciding True or False: Have students clean up. Then display or pass out the Sugar Facts Worksheet to pairs of students. Have them work in pairs to answer true or false for each statement. Allow students to discuss answers in small groups, and go over each statement as a class. You can have group representatives raise their hands to vote; call on some to give justifications. Then you can share some of the facts behind each statement. **(10 min.)**

4. Tasting: Explain to students that you've made a naturally flavored water for them that could be a substitute for these sugary drinks you've been looking at. Pass out small tasting cups of the infused water you've prepared. Ask students to describe the flavor. **(10 min.)**

5. Making Recipes: As a class, brainstorm other fruits and herbs that would taste good infused in water, and pass out the template to have each student create their own recipe to take home. **(10 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *What surprised you about the activity we did today?*
- *Why do humans like sugar so much?*

- *What information would you share with friends or family?*
- *How can we share this information with the larger community?*
- *What impact do you think sharing this information could have on families in our town?*

ADAPTATIONS

Garden: Make sun tea with students using herbs they've harvested from the garden. Allow the tea to sit in full sun for a couple hours; refrigerate the tea to serve to students the next day.

Classroom Extension: Share with students a list of all the other words sugar goes disguised as: high-fructose corn syrup, evaporated cane juice, corn sweetener, dextrose, or honey. Hand out a new set of nutrition labels. Have students find all the hidden sugars. This works well with canned soups and other foods that students might be surprised to see contain sugar. Explain that because food manufacturers are mandated to write the ingredients in order by weight, many companies use different names of sugar to spread out the total amount to not appear so high in the list. Show them an example.

ACADEMIC CONNECTIONS

Math Common Core State Standards

CCSS.MATH.CONTENT.5.MD.A.1

Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.

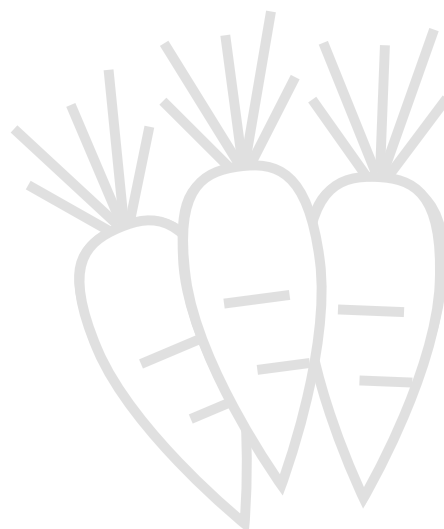
CCSS.MATH.CONTENT.5.MD.C.3

Recognize volume as an attribute of solid figures and understand concepts of volume measurement.

English Language Arts Common Core State Standards

CCSS.ELA-LITERACY.RI.5.7

Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.



Name: _____ Date: _____

Sugar Showdown Worksheet

Directions: Use this table to calculate the number of sugar cubes in each beverage.

DRINK NAME	Estimated Number of Sugar Cubes per Container	Actual Amount of Sugar per Serving (in Grams)	Actual Number of Sugar Cubes per Serving	Actual Number of Sugar Cubes per Container	How Close Was Your Original Estimate?
#1 _____	_____ cubes	_____ grams	_____ grams/4 = _____ sugar cubes	_____ cubes x _____ servings = _____ total sugar cubes	We were off by _____ cubes.
#2 _____					
#3 _____					
#4 _____					
#5 _____					

_____s Flavored Water Recipe

INGREDIENTS

1 cup _____ fruit

1 handful _____ herb

DIRECTIONS

**Crush herbs in your hands, and add to a ½ gallon jar or pitcher.
Add fruit, and fill your container with water.**

_____s Flavored Water Recipe

INGREDIENTS

1 cup _____ fruit

1 handful _____ herb

DIRECTIONS

**Crush herbs in your hands, and add to a ½ gallon jar or pitcher.
Add fruit, and fill your container with water.**

Sugar Facts: True or False? (Educator Copy)

The sugar that occurs naturally in fruit is the same as the sugar in sodas and other sweetened beverages.

False. The sugar in fruit and other naturally sweet foods is connected to fiber, vitamins, and other nutrients. This helps us digest it slowly and provides our body with nutrients we need. Added sugar in soda and other foods, however, provides sweetness but nothing else. This is why people often refer to it as “empty calories.” It is empty of anything we need other than calories.

We need to eat added sugar just like we need to eat fats and protein.

False. Although our bodies need sugar to function properly, our bodies can get sugar from eating plants (grains, starches, vegetables, and fruits) and other things in our diet. We don't need to eat any added sugar.

Sugar is a natural preservative, like salt, that makes food last longer.

True. This is one reason many commercial products add sugar to foods that don't necessarily need the sweetness, like canned vegetables, canned fruits, sauces, dressings, bread, or soups. This has made us all get used to everything tasting sweet.

Our bodies absorb table sugar almost instantly. For this reason, table sugar is better for us than fruit.

False. The first part of this statement is true, which is why eating something with a lot of sugar makes our blood sugar rise and then crash. Here's the good news: the sugar in fruit comes with fiber. Fiber helps slow down our bodies' absorption of sugar and helps us avoid a blood sugar spike and crash.

If we eat too much sugar at a meal, our bodies store it as fat.

True. When we eat more calories (energy) than our bodies need, we store them as fat. In times of food scarcity, it can be good to have fat stored for times when there is little food. In our current food environment where it is easy to eat a lot, even for a little money, this has become more of a problem.

We should eat at least six teaspoons of added sugar each day.

False. The American Heart Association suggests an upper limit of 24 grams, or 6 teaspoons, of added sugar for children per day. Unlike vitamins and minerals, which have recommendations for the minimum amount, with sugar the recommendation is for the maximum. This means that we don't need any added sugar, but if we choose to have some, we should limit it to 24 grams per day to stay healthy.

One 20-ounce soda is equal to the recommended daily maximum for added sugar for the whole day.

False. One 20-ounce soda has about 15–17 teaspoons of sugar. This is more than double the American Heart Association's maximum of 6 teaspoons . . . all in one beverage! This is also more sugar than is in a donut and about the same as in a slice of cake.

Humans crave sugar because of evolution.

True. Sugar is a basic, easy form of energy for the body. Sugar was beneficial to our hunter-gatherer ancestors because they could have long periods of intense physical activity and food scarcity; therefore, they needed to get energy whenever they could. In addition, “sugar” used to refer to the sweetness that comes from fructose which, in nature, is hardly ever found in toxins. Therefore, our bodies evolved to look for sweetness as a sign of safe, edible, energy-rich food.



Name: _____ Date: _____

Sugar Facts: True or False? Worksheet

Directions: Write True or False beneath each statement below.

The sugar that occurs naturally in fruit is the same as the sugar in sodas and other sweetened beverages.

We need to eat added sugar just like we need to eat fats and protein.

Sugar is a natural preservative, like salt, that makes food last longer.

Our bodies absorb table sugar almost instantly. For this reason, table sugar is better for us than fruit.

If we eat too much sugar at a meal, our bodies store it as fat.

We should eat at least 6 teaspoons of added sugar each day.

One 20-ounce soda is equal to the recommended daily maximum for added sugar for the whole day.

Humans crave sugar because of evolution.

Cycle of a Nutrient

THEME: EXPLORING THE ECOLOGY OF FOOD

5TH
GRADE

55
MIN.

WINTER

ESSENTIAL QUESTIONS

Where do the nutrients in our food come from?

Where do the nutrients in our food waste go?

Why is composting food waste an important step in the nutrient cycle?

LEARNING OBJECTIVES

✓ Students will be able to explain how the nutrients that nourish us are derived from soil and air.

✓ Students will be able to explain how our food waste can go back into the nutrient cycle in the form of compost to replenish the soil.

LESSON DESCRIPTION

In this lesson, students learn about the nutrient cycle and demonstrate their understanding of the nutrient cycle through a cartoon or narration.

MATERIALS

- Objects that represent the nutrient cycle, such as an apple, a decaying apple core, a small container of rich garden soil or finished compost, and a small twig
- Handkerchief or tray
- Cycle of a Nutrient Cards (p. 465)
- Cycle of a Nutrient Poster (p. 466)
- Paper for each student
- Markers and crayons

PREPARATION

- › Photocopy Cycle of a Nutrient Cards, and cut them out; create sets for partners. Set aside all the cards with images of a worm or a human to be passed out separately.

ACTION STEPS

1. Connecting the Dots: Gather students around a handkerchief or tray with objects that represent the nutrient cycle. Make sure that the objects are not in any logical order. For example, you might just have the twig, then the apple core, then the apple, and then the soil in a line. Explain to students, *These objects tell a story. But right now they're not in order! It's your job to figure out the mystery of how to reorder them to tell the story.* Pass out sets of cards (minus the worm and human cards) to pairs of students, and have students work in pairs to figure out the order the cards would go in to tell a story. The goal is to have students recognize that the decaying plant eventually becomes part of the soil, and the nutrients released in the process of decomposition help nourish a new plant. Have students share their story and, as they do, reorder your real objects to reflect the story they're telling (soil to twig to apple to decaying apple). **(5 min.)**



2. Animals in the Cycle: Pass out a picture of a human to each pair and ask, *How would a human fit into this story?* Pass out a picture of a worm and ask students how it would fit in as well. Call on pairs to share their guesses. Have students fill in the gaps where the first pair leaves off. If students don't mention it, say, *This is a story with no beginning and no end. It is a cycle.* Reorganize the objects into a circle to connect the dead plant to the soil and the soil back to the new plant. **(5 min.)**

3. Putting it All Together: Display the Cycle of a Nutrient poster. Explain to students, *Nutrients are chemical elements that all plants and animals need to grow. For example, Foods such as bread, tortillas, pasta, and rice all have a nutrient called carbohydrate that is a great source of energy. Fruits and vegetables have nutrients called vitamins and minerals that help our bodies work well and make us glow. That's where we get the word nutrition from. Nutrients move from our environment into living things. Once those living things die, they decompose, or break down, thanks to the help of decomposers. The process of decomposition releases the nutrients back into the soil, where they're ready to nourish and support new plant life.* Explain to students that the earth is very efficient at recycling waste, but humans often interrupt this cycle by throwing our food scraps into a plastic garbage bag that goes to a landfill. When we compost, we are giving those nutrients from our food waste right back to the soil, which helps us grow new food. **(10 min.)**

4. A Year in the Life of a Nutrient: Tell students, *I'm giving you the challenge to put yourself in the place of a nutrient! What would your life look like over the course of a year?* Give them the choice between drawing

their own cartoon or writing a narrative from the point of view of a nutrient. Have students start by thinking of one of their favorite foods. They will start their cartoon or narrative from the perspective of a nutrient inside an ingredient from that food. Have them include the food growing, part of the food getting eaten and part of it getting composted, the nutrients going back into the soil from composted food, and the new ingredients growing from that soil. For the food that is eaten, students can depict waste being excreted directly back into nature by animals. Circulate through the room, checking in with students and providing support. **(20 min.)**

5. Sharing: Have small groups of students share their cartoons and narratives with each other. **(10 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *Where do the nutrients we eat originally come from?*
- *What role do decomposers, such as worms, play in the nutrient cycle?*
- *What steps can humans take to play a positive role in the nutrient cycle?*

ADAPTATIONS

Garden: Have students find objects in the garden to represent the various components of the nutrient cycle, and have them put them in order to tell stories.

Physical: Play decomposer tag as an energetic way to reinforce the concept. Have one student

wear an armband indicating that they're "frost" (Death), and have a couple other students wear an armband in a different color, indicating their roles as "worms" (Decomposers). Have all other students be plants. If Death tags a plant, the plant is frozen until a Decomposer tags it, representing the decomposition cycle. Try playing where Death is allowed to tag the Decomposers to show that without decomposers recycling plant matter, there's no new life.

Musical: Teach students the song "Dirt Made My Lunch" by the Banana Slug String Band.

Extension: Have students create their own game to represent the nutrient cycle. You can show them *Caine's Arcade* for inspiration. Provide materials such as cardboard boxes, markers, tape, and marbles, but let students use their own imagination to dream up the game. Have students present how their game represents the nutrient cycle. Then allow students to play each other's games.

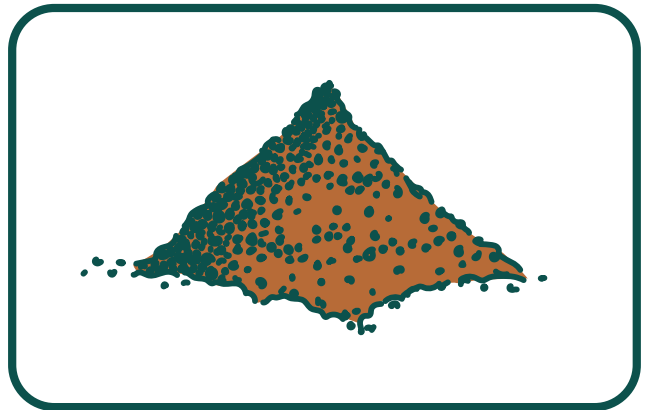
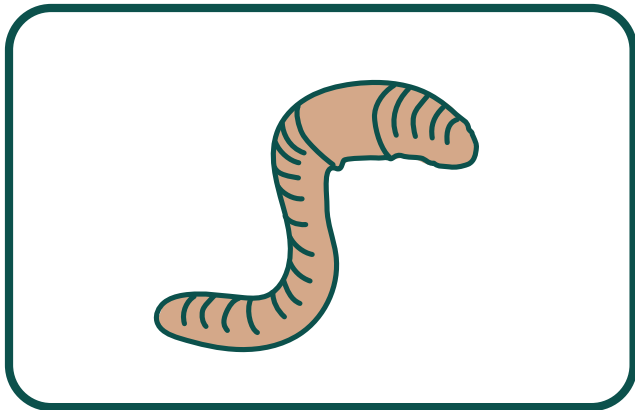
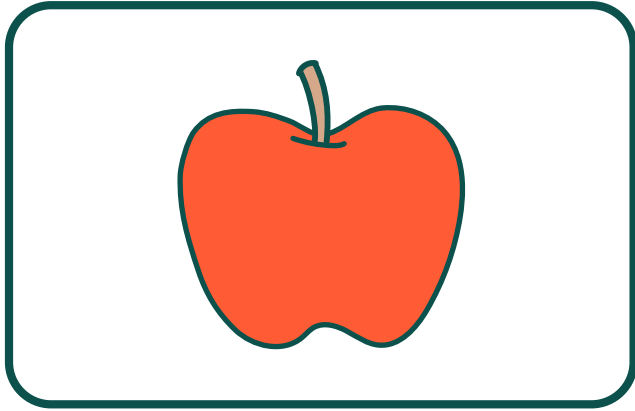
ACADEMIC CONNECTIONS

Next Generation Science Standards
Life Science Disciplinary Core Idea

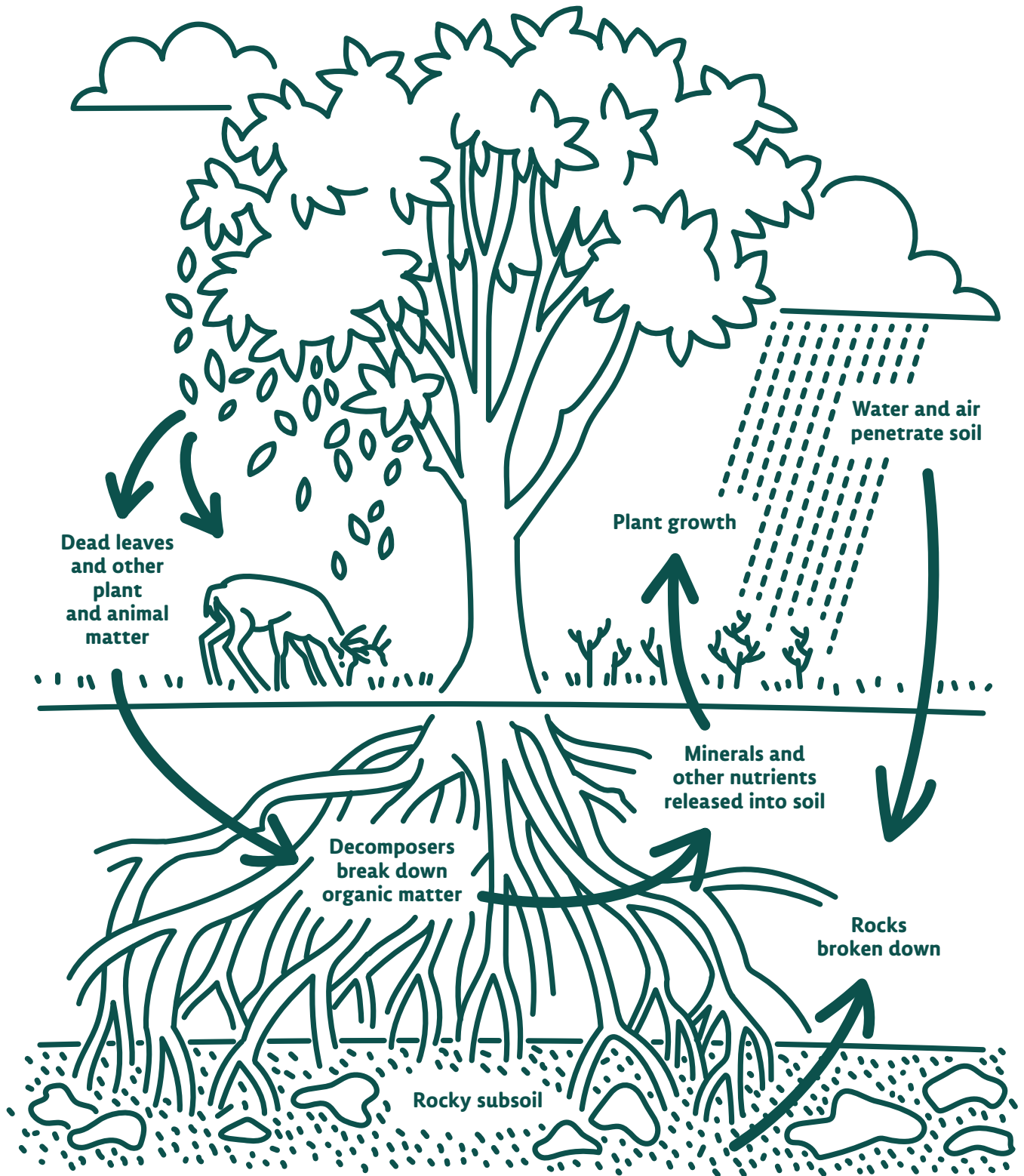
NGSS.LS.2.A.

The food of almost any animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants, while decomposers restore some materials back to the soil.

Cycle of a Nutrient Cards

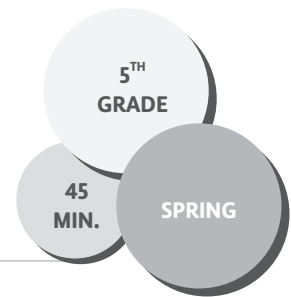


NUTRIENT CYCLE



Break It Down

THEME: GROWING AND ACCESSING HEALTHY FOOD



ESSENTIAL QUESTION

How is composting beneficial to our garden and our earth?

LEARNING OBJECTIVES

- ✓ Students will be able to describe the movement of matter among plants, animals, decomposers, and the environment.
- ✓ Students will be able to build a compost pile and explain the value of compost in a garden.

LESSON DESCRIPTION

In this lesson, students practice identifying and sorting biodegradable objects before they work in teams to learn how to build a compost pile in the school garden.

MATERIALS

- Vinyl tablecloth
- 5-10 Biodegradable items for display (try to have a variety of items, including items students may not immediately think of, such as a piece of a burlap sack, newspaper, or cotton shirt)
- 5-10 Nonbiodegradable items such as plastics and cans
- Watering cans or hose
- 1-3 wheelbarrows
- Shovels
- Digging forks
- Hand shears
- 3 wheelbarrows' worth of green compost materials, such as kitchen scraps, grass clippings, noninvasive weeds, or crop debris

- 3 wheelbarrows' worth of brown compost materials, such as straw, dried leaves, berry canes, or other branches
- 1 wheelbarrow worth of garden soil

PREPARATION

- › Scout a location for your compost pile in the school garden. Be sure it is close to a water spigot and easily accessible for hauling materials. Indicate the blueprint of your pile by laying branches to create a square, three feet by three feet.
- › Collect a variety of biodegradable and non-biodegradable materials for in-class sort.
- › Have some green and brown layers already broken down into six-inch pieces.
- › Designate a mound of garden soil to freely add to your compost pile.

ACTION STEPS

1. Sorting Biodegradable Objects: Gather students in a circle. Have a vinyl tablecloth in the middle of the circle, arranged with a mix of biodegradable and nonbiodegradable materials. Tell students that half of the materials have something in common with one another, and it's their job to figure out with the person sitting next to them what that characteristic is. Pick up two objects, for instance an apple core and an aluminum can, and say, *This one is,*

waving the apple, *but this one isn't*, waving the can. Tell students to whisper with their partner to figure out the rule. If they figure it out, they should keep it a secret but raise their hands to show another example to the class. Continue having different groups choose items and say, *This one is, but this one isn't*, until everyone in the class has caught on. **(5 min.)**

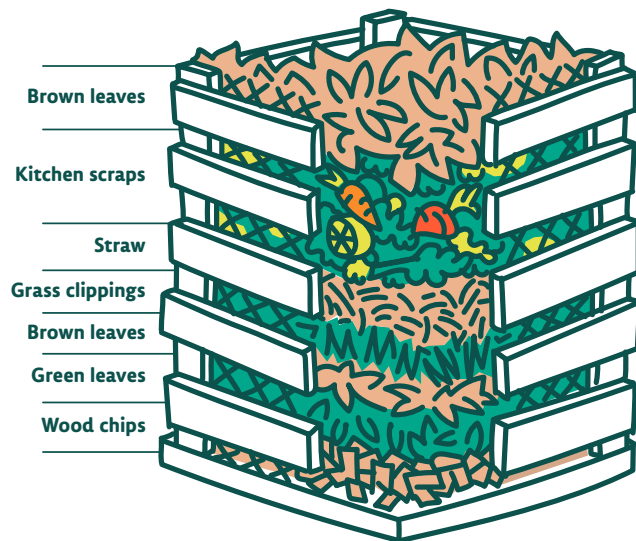
2. Revealing the Rule: Call on students to reveal the mystery rule. Students might say these things are biodegradable or are compostable. If students haven't already made the connection to decaying organic material, say something like, *So that means that anything decomposable would have been alive at some point.* Or ask students, *Which of these things were once living?* Explain, *All things that were once alive break down into their basic elements with the help of decomposers. When this happens, we get compost, which can be added to the soil to help grow more plants.* **(5 min.)**

3. Model: Gather students outside, and demonstrate building a mini compost pile. Consider having students build their own mini compost pile as you model, using just a handful of the required material for each layer. First, create a layer of broken sticks, explaining that this will help water drain from the pile so it's not too wet. Add a layer of greens and sprinkle with water. Explain the following: *This green layer, whether it's food waste, grass clippings, or weeds, adds nitrogen to our compost pile.* Add a layer of browns and sprinkle with water. Explain the following: *These woody materials such as straw, branches, or dried brown leaves are a source of carbon for our compost pile.* Add a layer of garden soil and sprinkle with water. Remind students of the following:

Though we might not see them, there are microorganisms in soil that are decomposers, just like worms, that will help break down the materials in our compost pile and help release all the good nutrients they hold. We add water because the microorganisms need water to stay alive, just like we do. **(10 min.)**

4. Demonstrate Tool Safety! Remind students that using garden tools is a responsibility and to keep tools low and be aware of their classmates as they're working. Model with students how you want them to hold and move with their tools, and let them know where tools should be placed when not in use. Emphasize and demonstrate how to keep the sharp or metal end of the tool below your waist at all times. **(5 min.)**

5. Building a Compost Pile: Divide students into four teams—Greens, Browns, Water, and Soil. Have a station where each group will work (i.e., a station for Green and Brown teams to cut up garden debris into smaller six-inch chunks and a mound of garden soil for the Soil team to shovel from). Depending on the size of your class, you might have a fifth group in charge of maintaining the compost pile with digging forks so that it stays square and level, or you can add that responsibility to the Water team. Explain to students that you'll call out when you need that team, and two representatives from the team can bring over materials while the rest of the team continues working to create smaller pieces. Monitor students working with tools as you're calling Greens or Water for the next step in the compost pile. Repeat until you've used all your materials and/or your pile is three feet tall. Be sure to end with a layer of soil. **(15 min.)**



REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *What are the layers in our compost pile? What purpose does each ingredient serve? What other ingredients could we have used?*
- *What do you think our compost pile will look like if we dig into it in a week? In a month? In six months?*
- *What strategies worked best when we were making our compost pile? What could have worked better?*
- *Who are the behind-the-scenes players helping our compost pile break down?*

ADAPTATIONS

Tasting: Have students create edible compost piles to reinforce the idea of layering green nitrogen-rich materials with brown carbon-rich materials. You can use crackers, nut butter, and greens.

Cafeteria Extension: Set up a station in the cafeteria for collecting compostable food scraps. Have students rotate to monitor the collection station and to add these scraps to the compost pile in the garden.

Classroom Extension: Have students visit the compost pile every couple of weeks to observe and record what living creatures are present. Students can even track a particular piece of garden debris or food waste, such as an apple core, to see how quickly it is decomposing. If you have a compost thermometer, have students record the temperature and graph the change over time as the pile heats up and then the temperature levels off.

Follow-Up: Be sure to involve students in maintaining the compost pile. Every three weeks, check the moisture level—it should be as wet as a wrung-out sponge. Turn your compost by putting the top layer on the ground beside your original pile. Keep transferring layers to the new pile until the bottom of the old pile is now the top of the new pile.

ACADEMIC CONNECTIONS

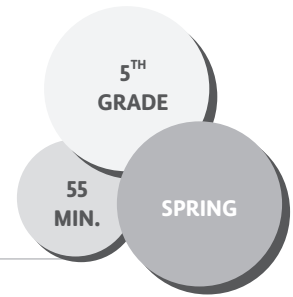
Next Generation Science Standards
Life Science Disciplinary Core Idea

NGSS.LS.2.A

The food of almost any animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants, while decomposers restore some materials back to the soil.

Rolling Into Spring

THEME: PREPARING HEALTHY FOOD



ESSENTIAL QUESTION

How can we prepare a healthy dish?

LEARNING OBJECTIVES

- ✓ Students will be able to practice knife skills.
- ✓ Students will be able to assemble veggie spring rolls and create a dipping sauce.

LESSON DESCRIPTION

In this lesson, students practice knife skills and balancing flavors to make veggie spring rolls and a dipping sauce.

MATERIALS

- Rice paper wrappers (1 for each student and a couple extra)
 - Vegetables: 3–4 options from the Possible Spring Roll Ingredients chart below or whatever is available; shouldn't need too much (see Preparation)
 - Dressing ingredients
 - Thermos or kettle of hot, potable water (make sure it's warm by the time you assemble spring rolls but not hot)
 - Index cards or scratch paper
 - Wax paper or 1 ceramic or plastic plate for each student (paper plates won't work well because the spring rolls stick to the paper)
 - Materials for cleanup
- Tray of the following for each group of 4–6 students:**
- Washed and portioned spring roll ingredients
 - Bowl or dish with high rim (to dip wrappers into warm water)
 - 2–3 Cutting mats
 - 2–3 Knives

- Small jar or bowl for sauce
- Grater
- Measuring cup
- Teaspoon
- Bowls for prepared ingredients
- Container for compost

PREPARATION

- ▶ If you haven't used rice paper wrappers previously, you'll want to make a test spring roll prior to teaching the lesson to confidently guide students in working with them.
- ▶ Write out roles on index cards for what each member in each group will do (e.g., in each group have a "cabbage shredder," "beet grater," "cucumber slicer," "herb chopper," and "sauce maker").
- ▶ Wash the produce, and develop a model of how each herb or veggie should be prepared (e.g., shredded, grated, sliced, etc.).
- ▶ Set up a sauce station in the room where sauce makers can come to get their ingredients.
- ▶ Prepare trays for groups with a small amount of each vegetable you're using. For every 4–6 students, for example, prepare ½ a head of cabbage to shred, ½ a beet to grate, ½ a cucumber to slice, a couple scallions to slice, and a ½ cup of cilantro.

POSSIBLE SPRING ROLL INGREDIENTS

Fruit and Veggies	Herbs	Dipping Sauce Recipe
Lettuce	Cilantro	¼ cup soy sauce or tamari
Beets	Mint	¼ cup lime juice
Carrots	Chives	¼ cup toasted sesame oil
Radishes	Scallions	1 tsp honey (optional)
Turnip		1 tsp garlic, minced (optional)
Cabbage		1 tsp chili paste (optional)
Mango		
Cucumbers		
Bell peppers		

ACTION STEPS

1. Engage: Pass a couple rice paper wrappers around the room and ask students if they know or can guess what they are and what they are made of. Explain, *Today we'll be making spring rolls. Different versions of these rolls are popular in Vietnam, Cambodia, China, and other Asian countries. Sometimes they also have pork, shrimp, or duck in them. We'll be making a vegetarian version today. (5 min.)*

2. Explain the Activity: Explain to students that each group member will have an official task in the group for preparing an ingredient, which you'll assign to them. Briefly go over each role, showing students each ingredient, and then explain that once all the ingredients are prepped, we'll learn how to assemble our spring rolls as a class. **(5 min.)**

3. Knife and Grater Safety Reminder (5 min.)

4. Wash Hands Break! This is a good time to pass out role cards to each person on a team. You can give sauce makers a copy of the recipe at this time as well. **(5 min.)**

5. Preparing Ingredients in Teams: Distribute trays of ingredients to groups of students. Circulate through the room, guiding students to be safe and use proper technique where needed. Give students a two-minute warning, and then call when time is up, and have students clean their spaces. **(10 min.)**

6. Model: Model how to make a spring roll. Be sure to go slowly and exaggerate and highlight the proper techniques you want to see from them. Say, *Dip the rice paper wrapper in warm water and count five seconds, and then gently place the wrapper on your clean plate or wax paper. Place a small amount of vegetables in the center of the wrapper, making sure you leave at least an inch on all sides. Fold in the sides tightly, and then roll from the bottom up, gently pressing the ingredients together as you go.* If your classroom has a document camera, project your demonstration so all students can easily see. Remind students that they are sharing the ingredients with their whole group, and if they put too many veggies in, their spring roll won't close, so they should only be taking small pinches of each ingredient. **(5 min.)**

7. Making Spring Rolls: Have helpers give each group of students plates or wax paper and spring roll wrappers. Meanwhile, walk around and pour warm water onto each group's large plate. Have students take turns dipping their rice wrappers and adding vegetables. Circulate as students are preparing spring rolls, reminding students to share and offering support where needed. If some students finish early, have them make extra spring rolls for their teachers, office staff, cafeteria staff, etc. **(10 min.)**

8. Tasting: Remind students about hygiene and that their sauce is for everyone, so they should drizzle the sauce on their spring rolls instead of dipping! Ask students for descriptive words to describe the taste and texture of their creations. **(5 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *What fruits and vegetables would you put in your rice paper wrapper to make a summer roll? What about a fall roll or a winter roll?*
- *What was challenging about creating your spring rolls? What was successful?*
- *What strategies did you find for working well in your groups?*
- *How did it feel to be in charge of one ingredient for your team's spring rolls?*

ADAPTATIONS

Garden Setting: Make these spring rolls a true testament to the season, and only use what produce is available in your springtime garden. Have students harvest, wash, and process your garden veggies.

Iron Chef: Conduct an Iron Chef competition in which each team chooses the ingredients to include in their spring rolls and/or their dipping sauce and then are judged on taste, presentation, and cooperation.

ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards

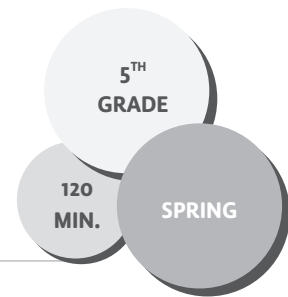
CCSS.ELA-LITERACY.SL.5.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 5 topics and texts*, building on others' ideas and expressing their own clearly.



Gratitude Feast

THEME: CONNECTING FOOD, CULTURE, AND COMMUNITY



Session 1: 60-min. planning period

Session 2: 1–2-hour Gratitude Feast, held at a convenient time for your students and guests

ESSENTIAL QUESTIONS

How can we express our gratitude to the growers and makers of our food?

What are the lessons about food and healthy living we'll remember most?

LEARNING OBJECTIVES

✓ Students will be able to prepare and present a celebration to honor all the people who help them eat well every day.

✓ Students will be able to articulate what they have learned about living up to their full potential and how this will affect their lives in the future.

LESSON DESCRIPTION

In this lesson, students plan and create a celebratory feast to honor the people who help them eat well every day. After brainstorming ways to honor and thank their guests, students craft invitations, decorations, conversation starter cards, and thank-you notes. This end-of-the-year celebration will also provide an opportunity for students to reflect on what lessons and habits from their time with FoodCorps they would like to bring into their next year.

MATERIALS

- Crayons, markers, colored pencils
- Butcher paper
- Nice paper for making invitations
- Index cards

- Plates
- Silverware
- Serving utensils
- Jars or vases for bouquets
- Materials needed to prepare your foods

PREPARATION

- › Three weeks prior to Session 1: Planning the Gratitude Feast, determine a time and location for the event. If it will include multiple fifth grade classes, you may want to reserve the cafeteria or another space for after school.
- › Two weeks prior to Session 1: Planning the Gratitude Feast, have students determine who will be invited and begin advertising the event through formal school communications (newsletter/website).
- › *Optional:* 1 week prior to Session 1: Planning the Gratitude Feast, solicit donations from local growers, food partners, and families.
- › Session 1: Together with your students, begin making personalized invitations, decorations, and thank-you notes for attendees.
- › After Session 1, and two to three days prior to the Feast itself, send a reminder email to invitees (FoodCorps partners, staff, etc.), and have the school remind families through formal communications (newsletter, website, automated voice messaging system, etc.)

SESSION 1: PLANNING THE GRATITUDE FEAST

ACTION STEPS

1. Brainstorming: Explain to students that today you'll be planning a celebratory feast to honor all the people who help them eat well. Ask, *Who should we invite? Who grows our food? Who prepares our food?* Have students brainstorm a list of people to invite including family, local farmers, cafeteria staff, and perhaps local restaurant cooks. Next, have them brainstorm ways to honor their guests. You might want to introduce the concept of giving toasts to honor people. **(10 min.)**

2. Reflecting on the Purpose of the Feast: Have students recall goals they set in their Full Potential Manifestos at the beginning of the year. Then have them explain how the people they just listed helped them reach those goals by growing, preparing, or providing them with healthy foods. **(5 min.)**

3. Creating a Celebratory Space: Depending on the time you have available and the amount of students involved, you might assign or have students self-select into different committees for the following tasks. Or you might have one classroom responsible for each task. **(15–30 min.)**

- **Invitations:** Have students create invitations with the pertinent information for potential guests. You can have them decorate the invitations with simple leaf rubbings or more elaborate flower pounding. **(15 min.)**

- **Thank-You Notes and/or Short Speeches:** Designate time for students to write thank-you notes or prepare short speeches to honor all the ways their guests have contributed to their healthy eating goals. (As you're wrapping up service in this community, consider this an opportunity for you to express gratitude to the school and those who've supported you in your service.) **(15 min.)**

- **Conversation-Starter Cards:** Explain to students that conversation-starter cards are a fun way to get different people talking who may not know each other. Provide some examples of conversation starters such as, *If you could only eat one food for the rest of your life, what would it be and why? Tell me about the first person who taught you how to cook. What's your favorite thing about your job? What's the most unusual thing you've ever eaten?* Provide students with index cards and colored pencils. Have them write as many cards as they'd like, and encourage them to decorate the cards. **(15 min.)**

Decorations:

- Have students harvest flowers or herbs from the garden for making bouquets to serve as table decor.
- Students can decorate butcher paper with pictures of their favorite recipes and lessons with FoodCorps as well as words of gratitude and inspiration for their guests. **(20 min.)**

4. Planning Food: Consider the following suggestions, but ultimately decide what makes the most sense based on your students and community.

- Ask students if they have a personal family recipe or something from their family or culture that they'd like to include.
- Ask students which were their favorite recipes that they've made so far this year, and decide on one or two they would like to recreate for the feast.
- See if a farmer has surplus crop that students can prepare for the feast.
- Alternatively, you might have students research celebratory foods around the world and vote on something to prepare. **(15 min.)**

5. Setting Intentions: Have students reflect on all that they've done and learned with FoodCorps. If students created a Full Potential Manifesto at the start of the year, have them review it and consider how they've been fulfilling the goals they set for living up to their full potential. **(15 min.)**

SESSION 2:: GRATITUDE FEAST

ACTION STEPS

1. Welcoming Guests to the Gratitude Feast:

Once all invitations are sent, decorations made, and food prepared, it is time for your Gratitude Feast! This is an informal gathering of community members who have supported your students' healthy eating throughout the year. During the Feast, welcome community members, and acknowledge them publicly for their contribution to a healthy school community. **(5 min.)**

2. Giving Thanks: Find some ways to acknowledge them, such as by having students share goals they set in their Full Potential Manifestos at the beginning of the year and having them explain how the people here helped them reach those goals by growing, preparing, or providing them with healthy foods. They could do this in written thank-you cards or in short speeches. **(10 min.)**

3. Feasting: Have your students introduce the foods they've prepared, including information on where things were grown and/or how they were prepared. Then invite guests to enjoy the food together! **(20–45 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *What are you thankful for?*
- *What have you learned about preparing healthy food? What have you learned about growing food? What have you learned about making healthy food choices?*
- *What will you carry with you after this year?*
- *What goals did you set in your Full Potential Manifestos at the beginning of the year? How did the people here help you reach those goals by growing, preparing, or providing you with healthy foods?*

ADAPTATIONS

Garden Setting: Consider having your feast outside in the garden if the weather allows!

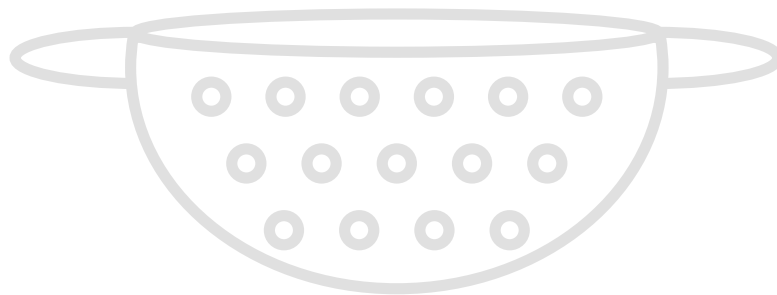
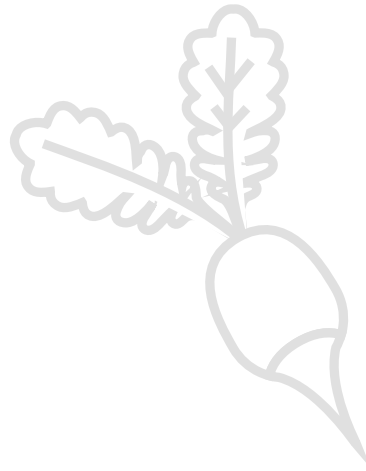
At Home: Have students discuss how they might translate this experience to eating at home. Who grows and prepares the food they eat outside of school, and how can they show their gratitude to these people?

ACADEMIC CONNECTIONS

English Language Arts Common Core State Standards

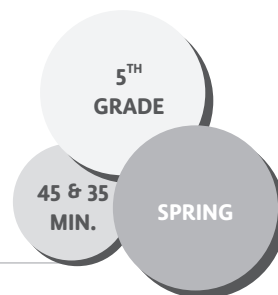
CCSS.ELA-LITERACY.SL.5.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 5 topics and texts*, building on others' ideas and expressing their own clearly.



Rotting Away, Day by Day

THEME: EXPLORING THE ECOLOGY OF FOOD



ESSENTIAL QUESTION

What factors affect how quickly an object will decompose?

LEARNING OBJECTIVES

- ✓ Students will be able to explain the process of decomposition.
- ✓ Students will be able to make predictions about the rate of decomposition.

LESSON DESCRIPTION

In this lesson, students look for signs of decomposition in the garden, consider the various factors that influence the rate of decomposition, and then bury a specific object that they unearth a couple weeks later to observe. This lesson can be taught in conjunction with FoodCorps lessons “Break it Down” and “The Nutrient Cycle.”

MATERIALS

- Pencils
- Magnifying glasses (optional)
- For each pair of students:
 - Decomposition Scavenger Hunt Worksheet
 - Observing Decomposition Worksheet
 - Clipboard
- Popsicle sticks, paint stirrers, or found sticks for each student
- Permanent markers
- Masking tape
- Trowels

- Butcher paper or newspaper on which to place decomposed objects during Session 2
- Rocks to weigh down the butcher paper or newspaper
- Garden gloves for students (optional)

PREPARATION

Session 1

- › Create a model identification tag by wrapping a piece of masking tape with your name written in permanent marker around the top of a stick.
- › Find something in the compost pile or elsewhere that is intensely rotting and perhaps has an “ick” factor.
- › Identify beds or sites in the garden where students can dig freely to bury their objects.
- › Photocopy Observing Decomposition Worksheet for each student
- › Photocopy Decomposition Scavenger Hunt Worksheet for each pair of students

Session 2

- › Place butcher paper or newspaper in one area of the garden, and weigh it down. This is where students will be able to gather around and sort their decomposed objects into a long spectrum.

FACTORS AFFECTING RATE OF DECOMPOSITION

Environmental

- Weather
- Temperature
- Moisture content in the soil
- Presence of decomposers

Characteristics of the Object

- Size of object
- Water content
- Whole vs. broken objects
- Surface area

ACTION STEPS

Session I:

1. Engage: Gather students in a circle, and show them your decaying item from the garden. Ask, *Do you know what this used to be? What has happened to it? How long ago do you think it was living?* Explain, *Today we're going to be setting up decomposition observations in the garden, but first we'll be going on a scavenger hunt throughout the garden to find elements and evidence of decomposition. (3 min.)*

2. Scavenger Hunt: Briefly review expectations and the strategy you'll use to gather them back together. Put students into pairs, then pass out clipboards with pencils and the Decomposition Scavenger Hunt Worksheet. Explain how to engage in the Scavenger Hunt by trying to find the objects. Help individual students stay focused during the hunt by asking open-ended questions such as, *Where do you think you might find . . . ? (10 min.)*

3. Explain: Gather students back together and explain, *We can use a lot of different words to describe when something is decomposing. Rotting, decaying, and decomposing all mean when an organic substance, something that was once alive, breaks down to its basic parts. This process can release all the nutrients it held back to the earth.* Ask, *What things do*

you think affect how quickly something breaks down or decomposes? Discuss environmental factors such as weather, temperature, moisture in the soil, and the presence of decomposers, in addition to characteristics of the object itself, including size, water content, and how much surface area is exposed. *We're each going to find an object in the garden that we're curious to see decompose. We'll bury our object, mark our spot, and then two weeks from now, dig it back up to see how it has decomposed. (5 min.)*

4. Burying Objects: Show students your sample location marker. Pass out materials so they can make one themselves. Be sure to outline parameters for what objects they can use and where they can bury them. For example, you'll want to remind students that their object must've been alive at one point, and you may want to say that there has to be at least ten more of their object still on the plant or in the space. Then point out the beds or places they're allowed to dig. Finally, before you set students free to find their objects, demonstrate how to safely use trowels. *(12 min.)*

5. Making Predictions: Have students fill out the Observing Decomposition Worksheet, applying the information they considered during your discussion of factors to make a prediction of how much their object will have decomposed by your next session. Collect the worksheets for safekeeping until your next meeting. *(10 min.)*

Session II:

6. Review Worksheet: Pass back students' Observing Decomposition Worksheets, and have them refresh their memories of their predictions. Ask, *Based on the weather we've had and how long it's been since we buried our*

objects, would anyone change their predictions? Discuss and then pass out trowels for students to dig up their object. **(5 min.)**

7. Unearthing Objects: Remind students that they are scientists, and they'll be comparing their predictions to their direct observations, just like scientists do. Then have each student find their buried object and observe the changes, drawing and recording their observations on their worksheet. **(10 min.)**

8. Making a Spectrum of Decomposition: Explain, *Now you'll compare your objects to other classmates'. Once you're in your groups, you'll create a spectrum of your objects, from least decomposed to most, or quickest rate of decomposition to slowest. Be prepared to explain to the class what patterns you observe in your groups.* Divide students into groups of six to eight. Have them line up their objects in a spectrum. Circulate, asking students to explain the rationale of their order. **(10 min.)**

9. Whole Group Drawing Conclusions: Have each group share their findings with the whole class. Ask, *What patterns did we notice? What factors seem to most affect how quickly something decomposes?* **(5 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

- *What factors affect decomposition?*
- *Was your prediction supported by what you observed?*
- *If you were to do this experiment again, how would you set up the test differently?*

ADAPTATIONS

Mini-Experiment: Two weeks or so prior to this class, bury a few different objects in the ground, such as a tomato, a carrot, and a pencil. Take a photo before covering them with soil. Then, to start this lesson, show students the photo, and dig up the objects. Use this “aha!” moment to engage students with the concept of decomposition before they set up their own decomposition experiments.

Planting with Compost Variation: If you have finished compost in your garden, plant an appropriate crop in a bed where you add compost to only half the bed. Have students periodically check the bed to observe differences between germination, growth rate, and health.

Indoor Worm Bin Variation: If you have a worm bin, you can set up experiments to see which food scraps the worms prefer or to observe the rate of decomposition when you have a whole fruit versus a fruit that has been cut into small pieces to increase surface area.

Music: Sing “The FBI (Fungus, Bacteria, and Invertebrates)” by the Banana Slug String Band with your students.

ACADEMIC CONNECTIONS

Next Generation Science Standards, Life Science Disciplinary Core Idea

NGSS LS2.A







Interdependent Relationships in Ecosystems
The food of almost any kind of animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. Some organisms, such as fungi and

bacteria, break down dead organisms (both plants or plants parts and animals) and therefore operate as “decomposers.” Decomposition eventually restores (recycles) some materials back to the soil. Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem.



DIRECTIONS: Look for the objects listed below that are part of the decomposition process. When you find one, check the box!

CAN YOU FIND...?


DECOMPOSITION CLUES:

<p>A leaf that's been chewed on</p> <input type="checkbox"/> 	<p>A piece of rotting wood</p> <input type="checkbox"/> 	<p>Dried, brown leaves</p> <input type="checkbox"/> 
<p>A dead flower</p> <input type="checkbox"/> 	<p>A rotting fruit</p> <input type="checkbox"/> 	<p>Worm castings (hint: they look like tiny round balls of soil)</p> <input type="checkbox"/> 

DECOMPOSERS:

<p>Fungus</p> <input type="checkbox"/> 	<p>An invertebrate, such as a worm, mite, or roly poly</p> <input type="checkbox"/> 	<p>Another decomposer?</p> <hr/> <input type="checkbox"/> ?
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HUMANS HELPING DECOMPOSERS:

<p>A compost pile in the garden</p> <input type="checkbox"/> 	<p>What's the freshest item you found in the compost pile?</p> <hr/> <input type="checkbox"/> ?	<p>What's the oldest item you found in the compost pile?</p> <hr/> <input type="checkbox"/> ?
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Name: _____ Date: _____

Observing Decomposition

Directions: Fill in the following chart.

Day 1

Object: _____

Date: _____

Draw a detailed picture of your object on the day you buried it:

Factors Affecting Decomposition

Environment:

What's the weather like today?

What was the soil like where you buried your object?

Did you see any decomposers?

Quality of your Object:

How big is your object? (estimate in centimeters or inches)

How soft or hard is your object? Describe its texture.

Has your object already started breaking down? How do you know?

What do you predict your object will look like two weeks from now?

Day 2

Object: _____

Date: _____

Draw a detailed picture of your object on the day you buried it:

How has your object changed in terms of its size, weight, texture, smell, color, etc.? How does this align with your original predictions?

If your object is smaller than it was originally, where do you think the missing matter or "stuff" might have gone?



