

Garden Grids

THEME: GROWING AND ACCESSING HEALTHY FOOD

4TH
GRADE

55
MIN.

SPRING

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.

CONCEPTS

grid inches measurement
seed spacing square feet tool safety

Engaging the Classroom Teacher

- Prior to the lesson, ask the teacher about students' level of familiarity with area and multiplication. Together you can determine how much explanation students will need during Action Step 2.
- Also check in with the teacher about students using hammers and nails, encouraging the teacher to discuss this big responsibility with students beforehand.
- Ask the teacher whether they can supervise the Planning a Bed rotation during Action Step 5 while you're planting with students. Also discuss whether there is another staff member or volunteer who can supervise students doing the chore rotation, if using.

- During Action Step 7, suggest that the teacher help students while they are watering and labeling their new plantings.

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 lesson A Patchwork Garden Quilt 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. 490)
 - 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.
- › Pre-fill 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. A four-square court is a grid. 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, we multiply 4 by 4 to find out how many one-foot squares we would have. So how many squares do we have to plant in? (16) You might draw lines on your four-square court for students to count and visualize 16 square feet. 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.)**

Social and emotional learning

- *Ask yourself: Did I use tools safely and work well with my partner?*

Check for understanding

- *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?*

ADAPTATIONS

Experiment 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.

SQUARE FOOT GARDENING EXAMPLE:

