

Useful Plants

These indoor and outdoor activities illustrate the importance of plants in the daily lives of humans from traditional and contemporary cultures. Students will draw comparisons between objects made from plants and their modern-day counterparts and try their hand at creating a useful object or craft made from plants.



A basket handmade from daylily leaves and multiflora rose stems nestled in a patch of daylilies.

Harvesting plant material for natural crafts is a creative way of managing invasive species!

Learning Objectives:

- **Describe** ways in which plants are personally used in student's everyday life
- **Explain** the importance of plants to traditional cultures
- **Compare and contrast** modern and traditional objects that are or were made from plants and their uses
- **Evaluate** the quality of modern and traditional versions of objects
- **Select** plants based on their useful applications and construct an object or structure to solve an everyday problem

NJSLS Connections:

K-PS3-2: Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area.

1-LS1-1: Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.

Instructor Background

For thousands of years, people relied on the local plants of their region for their everyday needs, including food, medicine, clothing and textiles, building materials, and tools. However, the seasonality of plants meant that not every kind of food or medicine was available year-round. People had to be diligent about collecting, preserving, and storing these important plants when they were in season to prepare for times in the year when they were not as abundant. The way we use plants has changed over time, but virtually all people still depend on plants to meet their daily needs.

Today, with global commerce and modern technology, we no longer need to rely only on the plants found in our local ecosystem. Surprisingly, even some modern solutions have unexpected botanical origins. Rubber is an example of a material originally discovered in plants which is now reproduced synthetically. Salicylic acid, a compound used in aspirin and as a topical acne treatment, was originally derived from willow tree (*Salix*) bark as the compound salicin.

Despite all our modern innovations humanity still relies on plants for raw materials. Natural fiber textiles like cotton and linen are lauded as more sustainable, durable, and higher quality than their polyester counterparts. Semi-synthetic textiles, like rayon and Lyocell, are partially made from cellulose derived from wood pulp. Cellophane, a clear film used as a packaging and wrapping material, is also made of cellulose despite its plasticky appearance. Regardless of modern solutions, retaining knowledge of our planet's useful plants will allow us to continue to explore and innovate technology inspired by our botanical resources.

Useful Plant Discovery Centers

Supplies

- Useful Plant Centers worksheet
- Writing utensils
- Examples of modern and traditional versions of everyday objects as listed on the next page.

Optional

- Clipboards or recycled cardboard to lean on

Preparation

Create discovery centers to compare examples of objects made from plants and their modern-day counterparts. Photographs can be used to represent objects that would be impractical to have at the centers.

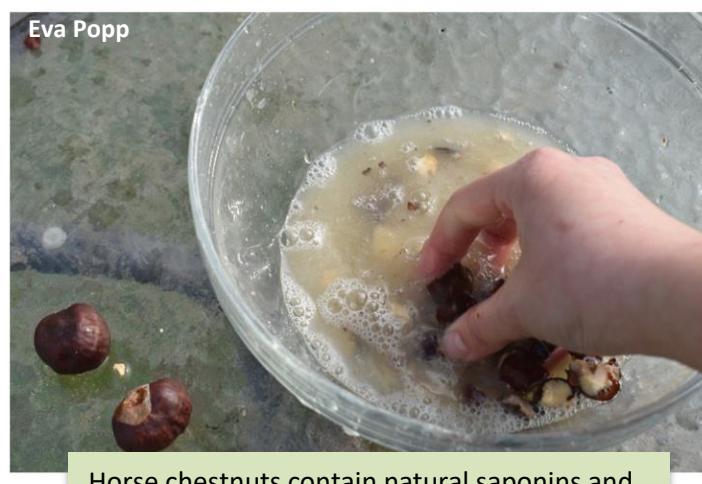
Supplement the suggested categories and items for centers listed on the next page with any other ideas you can think of!

Useful Plant Discovery Center Setup

Useful Plant Objects and Modern Counterparts

Clothing

- Shoes: foam flip flops and woven reed sandals
- Packs: synthetic backpack and woven basket
- Textiles: polyester t-shirt and woven plant fiber textile clothing (e.g. linen or cotton)



Horse chestnuts contain natural saponins and can be chopped or crushed and agitated in water to create a soapy lather!

Personal Care

- Soap: liquid hand soap or laundry detergent and horse chestnut “soap”
- Dye: commercial hair dye and black walnut shells
- Insect repellent: bug spray and crushed sassafras leaves

Buildings and Transportation

- Houses: Lumber-framed houses and Lenape wigwam homes
- Boats: Aluminum canoes and dugout canoes
- Snowshoes: aluminum and made from conifer branches

Tools and Household Goods

- Water container: plastic/metal water bottle and dried hollow gourd container
- Rope: synthetic nylon rope and spun fiber plant cordage
- Paper: manufactured printer paper and handmade plant fiber paper
- Sponge: synthetic kitchen sponge and dried luffa gourd
- Insect repellent (clothing): mothballs and red cedar wood

Medicine

- Sunburn: aloe-based gel and aloe leaf
- Nausea: OTC medicines or ginger candy and ginger root
- Headache: aspirin and willow tree bark
- Insect bites: “Afterbite” itch soother and common plantain leaves
- Poison ivy/oak rash: calamine lotion and jewelweed leaves

Useful Plant Discovery Center Procedure

Introduction

Choose one of the following introductions or modify to fit the age range of your audience.

Older students

For **older students**, instruct them to write a list of everything made of plants that they encountered today. They may think they can quickly finish the list, but prompt them with questions to expand their thinking: “What did you eat for breakfast?”, “Did your cereal come from a cardboard box?”, “What is your kitchen table and chairs made of?”, “What material are your clothes or sheets made of?”, “What about the pencil you’re writing with, or the paper you’re writing on?”, etc. Once students have completed their lists, discuss their impressions and takeaways of the activity. Did anything surprise them?

Younger students

For **younger students**, explain traditional cultures’ reliance on nature for everyday needs: “Today, when we need food to make dinner, or we need some new shoes for school or furniture for our house, what do we do?” (Expected response: go to the store or buy online).

“A long time ago, there were no stores or restaurants, or buildings, cars or roads. There was only nature: the forests, meadows, streams, and lakes and the animals and plants that live there. The people who lived here in New Jersey a long time ago are called the Lenape. The Lenape did not have stores to shop at to get food, clothes, medicine, or furniture. Everything they needed to survive had to come from nature”.

Introduce the Useful Plants Discovery Centers activity: “Here are examples of different things we use every day that used to be made of plants. Some of these items we still make from plants, and other items are made of man-made materials”.

Activity

Distribute the Useful Plant Centers worksheet if using. Split children into groups and rotate them between centers. If using the worksheet, students will record one example of a modern and a traditional item from each center. For a class of younger children that may need more direction and guidance, instead of the centers format you may choose to exhibit the items as a “show and tell”.

Written Reflection

Option to use the completed Useful Plant Centers worksheet for students to develop a written response. For older students, you may also ask them to choose a specific comparison of a modern and traditional object from one of the centers and develop a verbal or written response as to which item they think is better and why. Note that man-made objects may be more durable, but items made from plants may be more sustainable.



A wreath made from native Virginia creeper (*Parthenocissus quinquefolia*) vines beside invasive Japanese honeysuckle (*Lonicera japonica*), another vine ideal for weaving baskets or wreaths.

Discussion Questions

- Which of these things have you used or heard of before?
- Which things surprised you?
- How did you feel learning about how people use plants to create useful objects?
- What things made from plants do we still use today?

Extension Activities

- **Useful Plant Brainstorm:** Head outdoors for a nature walk. On the walk, invite children to search for plants that could be useful. Brainstorm uses for plants you find along the way, e.g. a large skunk cabbage leaf can be used as an umbrella, or a Japanese honeysuckle vine can be used as string or rope. Encourage creativity and imagination rather than correct or realistic responses. Allow children a chance to engage with these found plant materials to explore their potential uses.
- **Natural Crafts with Plants:** Choose a craft or crafts from the links in the resources section. Provide natural materials or collect materials with the students and complete the craft.
- **Videos of Traditional Uses for Plants:** Show a video or videos from the resources section below to share with students how the Lenape and other traditional cultures used plants for building materials, medicine, and other everyday needs.

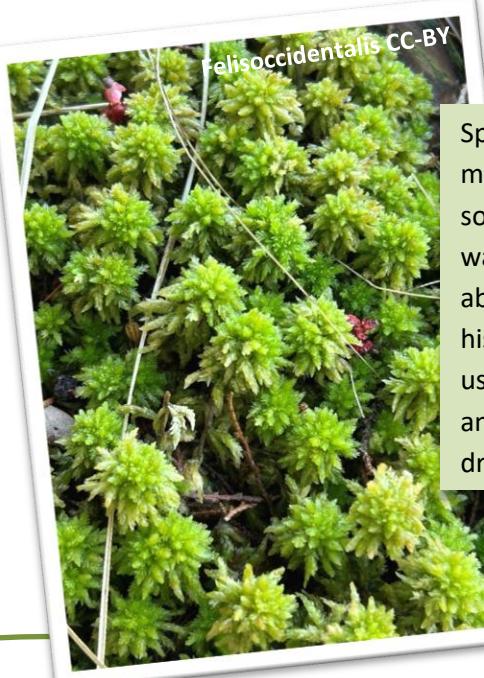
Useful Plant Building Challenge

Supplies:

- String, hula-hoop, etc. to delineate building spaces

Optional:

- Shovels, clippers, or other tools
- Twine
- Pre-sourced plant materials suitable for building
- Clipboard, paper, and writing utensils for planning invention



Sphagnum mosses, with their soft texture and water-retaining abilities, have historically been used as diapers and wound dressings.

Preparation

Scout an area for the building activity. Ensure that there is a variety of plant materials nearby that can be used for building. Determine an area for building and delineate a building spot for each team.

If you'd like to make their challenge a bit easier, you can provide twine and tools like clippers, shovels, etc. Or you may encourage them to find natural materials to use as tools!

Procedure

Introduction

Recall how the Lenape people living in New Jersey thousands of years ago had to source everything they needed from nature.

Prompt students to think of a problem that they, their class, or their community faces in daily life. If they have trouble, they can also imagine an everyday problem faced by a character in a book or movie.

Challenge your students to plan and build an invention to solve their problem using only materials found in nature, like the Lenape people and other traditional cultures did long ago. Option to allow students to design a plan on paper before venturing outdoors to build. You may choose to have students work in teams, pairs, or individually.

Activity

Assign each team or student a delineated spot to build their invention and point out the larger zone from where students may gather their plant materials for building. Review identifications of plants in the area that are harmful to touch, like poison ivy.

Allow students to gather materials from the predetermined zone and commence building. If students have trouble, ask questions to lead them to devise their own solution rather than providing a solution for them.



Eva Popp
Japanese honeysuckle (*Lonicera japonica*)

Share and Discuss

Once all students have completed their inventions, invite them to share with the class. Challenge your students to present their inventions in a fun way. They may deliver a quick pitch to sell us their invention like in a commercial, or you may have the class guess what each invention is for.

After each invention is shared, ask the creators about what plants they chose and why (note: it is not necessary to identify the plants by name, but rather their characteristics, e.g. "This thin vine was used to lash the sticks together").

Also ask if students ran into any challenges when building: "Is there any material you needed and couldn't find, or tools you wished you could have used?"

Discussion Questions

Discuss general takeaways of the activity:

- How was your experience building your invention?
- What if all your possessions had to be sourced from nature and built in this way?
- What are the advantages and disadvantages of using natural materials to build a solution to your problem?
- Did you take any inspiration from the examples of useful plants we saw earlier?
- Can you think of any modern-day solutions that already exist for your problem?

Materials

Useful Plant Centers worksheet:

https://www.canva.com/design/DAF_-EYMX4g/LgkuNh3zjM_XFBz7alx9Ug/edit?utm_content=DAF_-EYMX4g&utm_campaign=designshare&utm_medium=link2&utm_source=sharebutton

Resources

Traditional uses of plants

- Useful plants of the Lenape people <https://nanticokelenapemuseum.org/learning-center/742/plant-medicine/>
- Native American ethnobotany database <http://naeb.brit.org/>
- USDA Ethnobotany homepage
<https://www.fs.usda.gov/wildflowers/ethnobotany/index.shtml>
- Traditional fiber plants
<https://www.fs.usda.gov/wildflowers/ethnobotany/fibers.shtml#:~:text=They%20come%20from%20the%20outer,cattail%2C%20agave%2C%20and%20yucca.>
- Traditional production of flax into linen
https://www.youtube.com/watch?v=Vufzi13xxng&ab_channel=RevolutionaryGazette

Modern uses of plants

- Willow as a living fence and for ecological restoration:
https://www.youtube.com/watch?v=MPRO0-06L2ks&ab_channel=AndrewMillison
- Modern production of flax into linen:
https://www.youtube.com/watch?v=Fve2rDj9zrc&ab_channel=ArteltalicaandCrownLine nDesigns
- Modern production of cotton: <https://www.youtube.com/watch?v=QHgNoSYlhYs>
- Modern items made from plants:
 - <https://www.americanforests.org/article/7-everyday-items-made-from-trees/>
 - <https://pbpc.com/product-examples/>

Natural Crafts from Plants

Crafts inspired by the Lenape's use of plants:

- Basket weaving
 - Weave a natural vine basket:
<http://youngnaturalistsclub.com/2020/05/22/honeysuckle-baskets/>
 - Weave a cardboard and yarn basket: <https://www.triedandtrueblog.com/super-easy-cardboard-basket-weaving/>
 - Weave a paper basket:
https://www.youtube.com/watch?v=qM9YECwZHiA&ab_channel=ChoosyKids
- Spin cordage/make a grass rope
 - <https://www.instructables.com/Make-rope-out-of-dead-plants---with-no-tools/>
 - https://www.youtube.com/watch?v=DljWyRQFrNc&ab_channel=NightHawkInLight
- Cattail dolls https://www.primitiveways.com/cattail_doll.html
- Grow and dry gourds to paint or make containers
<https://hortnews.extension.iastate.edu/2000/8-25-2000/gourds.html>

More options for useful plant crafts:

- Stick frame weaving
https://www.youtube.com/watch?v=YQdgjYjefIg&ab_channel=WoodlandForestSchool
- Dye wool/cotton fabric with plant dyes
<https://kidsgardening.org/resources/lesson-plans-exploring-plant-dyes/>
- Create printed fabric with leaves and flowers
<https://kidsgardening.org/resources/garden-activities-leaf-and-flower-prints/>
- Use plants as paints to color a coloring page
 - <https://aroundthekampfire.com/2019/02/chlorophyll-paintings-plant-science-leaf-rubbing-art-activities.html>
 - <https://www.engineeringemily.com/coloring-using-plants-earth-day-steam-activity-for-kids/>

Videos

Videos about the Lenape people and their use of plants:

- Foraging

https://www.youtube.com/watch?v=SGzV0j_X7Xo&t=232s&ab_channel=TheStatenIslandGreenbelt

- Agriculture

https://www.youtube.com/watch?v=sJJ_gQvb0Cg&ab_channel=TheStatenIslandGreenbelt

- Medicine

https://www.youtube.com/watch?v=Q9mOe8rAYU8&ab_channel=LizNeves

- Shelter

https://www.youtube.com/watch?v=B0jfdunGbFk&t=3s&ab_channel=LenapeLifewaysVideos