Where Food Grows Build a Root Viewer

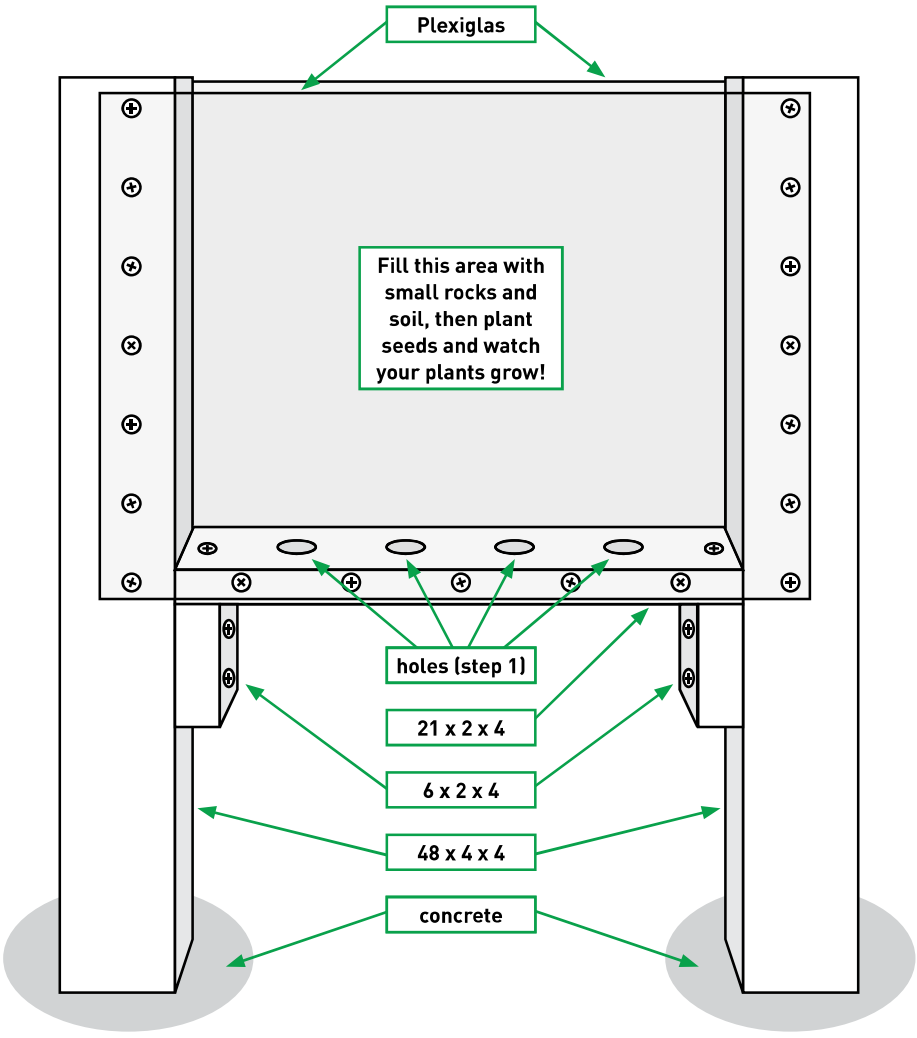
HANDS-ON SCIENCE

Note: *This lesson was developed in association with Out Teach, an organization that empowers teachers to use outdoor instruction as a way to create unforgettable learning experiences.* www.out-teach.org

You can use a root viewer to teach experiential lessons in: Science — parts of a plant, life cycle of a plant, soil, sediment, layers of local soil/earth, decomposition, decomposers, variables, and insects.

What You Will Need:

- (2) 48x4x4-inch cedar posts
- (1) 21x2x4-inch cedar board
- (2) 6x2x4-inch cedar board
- (2) 24x16-inch sheets of Plexiglas
- drill with 1-inch drill bit
- pencil
- box of washer screws
- wood screws
- shovel
- level
- (2) bags of concrete
- (1) bag of small rocks
- (1) bag of soil
- seeds



Directions

1. Drill four equally spaced holes through the top of the 21x2x4-inch cedar board.
2. Lay the two 48-inch cedar posts parallel to each other on the ground. Place the 21x2x4-inch board with holes between them. Lay one sheet of Plexiglas on top of all posts so that it is flush with the top of the 48-inch posts, centered between them, and aligned with the bottom edge of the 21-inch board. Use a pencil to mark the bottom of the 21-inch board on the 48-inch posts.
3. Align one 6-inch board with the marked spot on each 48-inch post. Attach the boards with wood screws. Then lay the 21-inch board on top of the 6-inch boards. Attach it with wood screws.
4. Mark seven equally spaced holes on each 48-inch post and five equally spaced holes along the edge of the 21-inch board.
5. Drill holes and use washer screws to attach the Plexiglas to the posts and board in those locations.
6. Flip the frame over. Repeat this procedure with the second piece of Plexiglas on the other side of the root viewer.
7. Dig two 14-inch-deep holes the width of the root viewer. Place the root viewer in the holes, ensuring that it is level.
8. Mix the concrete according to directions and pour it in the holes. Allow the concrete to set.
9. Pour two inches of small rocks inside the root viewer. Add soil. Plant seeds and enjoy!

Where Food Grows Plant Parts

SCIENCE

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Kindergarten Standard Supported

- **NGSS Science and Engineering Practices: Analyzing and Interpreting Data:** Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. (K-LS1-1)

First Grade Standard Supported

- **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. (1-LS1-1)

What You Will Need

- journals, pencils, plants, chart paper or portable white board, tear-by-hand tape for sample taking (optional), a fill-in-the blank diagram of plant parts

Science Background

A good way to view different types of plants is to tour an outdoor garden or simply go outside and observe plants growing near the school. As you do, have students inspect the plants to identify and learn about the parts that help the plants grow.

Every plant has some form of roots, stem, leaves, flowers, seeds, and fruit (except for spore plants like ferns). It's easy to spot these parts during the growing season, though you'll have to uproot weeds or dead plants to see the roots. In winter, when it is hard to find growing flowers or fruit, dried flowers can be used instead.

Before you go, be sure to point out hazards such as poison ivy and warn students not to eat anything they find. Some plant parts are poisonous.

ENGAGE

Poll the class to see how many students think plants have body parts like people do. Encourage volunteers to explain why they voted as they did and give examples to support their opinions.

EXPLORE

Take the class to an outdoor garden or on a walk around the school. Instruct students to closely observe several different types of plants in the area. Encourage students to create a sketch of their favorite plant. Then challenge students to write or draw in their journals everything they observe about what the plant looks like, what parts it has, where it grows, and how it compares to a different type of plant growing in the same area.

EXPLAIN

After students complete their observations, have them turn and talk with a partner to discuss what they learned about plants. As students compare their drawings and notes, guide them to recognize that all plants have the same parts. As a class, discuss what the parts do and how each part helps the plant survive. (*Roots: anchor plants to the ground, bring up water and food from the soil; Stem: helps the plant stand up and moves food and water from the roots to the top parts of the plant; Leaves: the part of the plant that turns sunlight into food. Leaves also have little openings that let the plant breathe; Flowers: attract pollinator insects so that seeds can form; Fruit: Some plants produce a fruit around the seed that people and animals can often eat; Seeds: the part of the plant that will grow into a new plant.*)

ELABORATE

Remind students that many of the foods they eat come from plants—but not all foods come from the same plant part. Brainstorm a list of foods that come from different plant parts. Then challenge students to draw pictures of one food that comes from each part of a plant.

EVALUATE

Give each student a fill-in-the-blank diagram of plant parts. Challenge students to correctly name each part. Encourage them to share and compare their results in small groups or with a partner.