Exploring Natural Objects

Grade Level: K-6
Length: 15-30 Minutes
www.pwsrcac.org/lessons

NGSS Standards

2-LS4-1 Make observations of plants and animals to compare the diversity of life in different habitats.

4-LS1-1 Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

Crosscutting Concepts

Structure & Function The way an object is shaped or structured determines many of its properties and functions.

Related Resources

Videos
https://www.kimsnaturedrawings.com/instructional-videos

Websites
https://johnmuirlaws.com/journaling-curriculum/

Overview

Diverse plant and objects are part of the natural world.

Objectives

- Students will recognize that there is a wide variety of things that can be found in nature.
- Students will learn the purpose of different objects in nature.
- Kindergarten through 2nd grade students will sort natural objects to compare diversity of life in different habitats.
- 3rd-8th grade students will complete a scientific sketch of a natural object and explain in writing how the structure is useful to a plant or animal for survival, growth, behavior, and reproduction.

Materials

- ☐ Piece of Fabric or Bandana
- ☐ 5 Unique Natural Objects
- ☐ Tarp or Large, Shallow Box (if indoors)
- ☐ 5-10 Natural Objects per student (if indoors)
- ☐ Paper of Science Notebooks
- ☐ Pencils

Background

This activity has students look closely at objects from the natural world, increasing their awareness of the variety that exists in nature. This will help to prepare them for future learning about ecosystems.

Notes

Preparation

It is easiest to conduct this activity in an outdoor place with easy, safe access to a variety of natural objects (leaves, seeds, rocks, shells, flowers, etc.) Open forests and beaches work very well. To align with the NGSS requirements about comparing habitats, either choose an area that spans two different habitats or repeat the activity in a different habitat.

If you choose to conduct it indoors, you will need to collect a large number of natural objects. Students are going to try to match the objects you reveal, so if you are going to reveal a clamshell, it is best to have at least one clamshell per student in your collection. You may also choose to include objects that are somewhat similar to what you reveal, like a mussel shell or dry, white leaf. Spread these objects on the tarp or large shallow box. Secretly place your five objects underneath a piece of fabric at the front of the class. If you are not familiar with your objects, use books or the internet to learn more about them.

Introducing the Lesson

Have students brainstorm some of the coolest objects they have found in nature. Ask them if they have gone beachcombing before, or looked for leaves in the forest in fall.

Introduce the students to the word “Biodiversity” – different kinds of life that exist in a certain place. Emphasize that biodiversity means different animals, plants, or other types of life. In this activity, they won’t be looking at the whole animals, plants, or other organisms directly. Instead, they are going to look at objects that are parts of living things or come from living things –like shells, seeds, twigs, etc.

Activity

1. Tell your students that you have gathered five very special natural objects. You will reveal these objects for a few brief seconds (5-15 seconds works well, depending on your group), and then they will set out to find similar objects (in nature if you are outside, on the tarp if you are inside). Be sure to warn them of any hazards, like not picking stinging plants, etc.
2. With a great flourish, pull back the piece of fabric and reveal the natural objects for the designated length of time. Ensure all

students are able to see before you recover the objects. Send students out to collect objects as similar to yours as possible.

3. Once students have finished collecting their five objects, have each student sit in a circle around you with his or her natural objects arranged in front of the student.
4. Dramatically pull one object at a time out from under the fabric. Hold it up for everyone to see, and have students hold up their parallel objects. Explain how you can identify the object (i.e. it is white and chalky, curved, with ridges on the outside), what it is used for (i.e. this shell keeps clams protected from waves, drying out, and getting eaten) and how it came to be (i.e. this shell was created by the clam). With older students, delve more deeply into the structure and function of the objects that you have revealed; include students in the discussion of what the object is, what is used for, and how the structure supports that function. Identify and describe some of the other objects students found that didn't quite match yours.
5. Then pull out and discuss the second object. Repeat this process until you have revealed all five of your objects.

Wrap-up

Have students group objects together that look similar but have different functions. Them have them group objects together that have similar functions even though they look different. Discuss with students how there are many similarities and differences in nature. Some parts of plants or animals may look very different but exist for the same purpose (i.e. leaves & needles, cones & acorns, different types of shells, etc.) and some parts may look very similar but have different purposes (i.e. ferns & feathers, acorns & shells, etc.).

Assessment

For younger students, have them categorize the objects into piles based on the habitat the object came from. This might look like one pile for the beach, one pile for the forest, one pile for the field, etc. The number of piles will depend on the number of areas you originally collected items from.

>>Educator Tip: There isn't always a clear line between habitats. Sometimes organisms (and objects) exist in both adjacent habitats, or thrive at the edge of the two habitats. To reflect this, you could instead have the students arrange the objects on a line rather than sort them into discrete categories. One end of the line could represent the forest, for example, and the other could represent the meadow. A spruce cone would belong near the

forest end of the line, a tuft of fireweed seeds would belong near the meadow end of the line, and a bird feather might be near the middle.

Students who demonstrate mastery will be able to successfully sort 80% of the objects OR will be able to effectively explain their choices if the categorization does not match the way you would have sorted them.

Have students look at their piles representing different habitats. Does one pile have way more objects than the other pile(s)? Based just on this information about object diversity, ask students to make a hypothesis about which habitat might have greater biodiversity – more different types of living things.

Then, have students participate in a think-pair-share activity to discuss whether the diversity in the piles matches the diversity they've observed in their habitats. For example, if there is a greater diversity of objects in a pile representing the forest than in a pile representing the meadow, does this match their prior knowledge of biodiversity in the forest and meadow? Assess student explanations for understanding of the concept of biodiversity and descriptions of patterns they've observed in the activity or in their lives.

For older students, to align with NGSS 4-LS1-1, ask students to choose one natural object. Guide them through creating a scientific sketch of the object.

>>Educator Tip: When helping students to complete a scientific sketch, show them examples of sketches that you or others have done. Point out that it is important for scientific sketches to highlight key features of the object. Show them how they can use a ruler or other object to help measure the proportional scale of the object (length, width, height, placement of other visual markers). They should begin by focusing on the exterior contour lines of the object (outline). Then they can fill in additional interior contour lines, shading, texture, and other details. For a detailed tutorial on scientific sketching with kids, see these great video resources from Kim's Nature Drawings: https://www.kimsnaturedrawings.com/instructional-videos *or check out John Muir Laws' Nature Journaling Curriculum:* https://johnmuirlaws.com/journaling-curriculum/

Ask each student to explain in writing how the structure is useful to a plant or animal for survival, growth, behavior, and reproduction. Evaluate these drawings for clear, thorough explanations of how the

structure assists the plant or animal in at least one key function related to survival, growth, behavior, or reproduction.