Invent an Invertebrate

Grade Level: 4-12
Length: 30-60 Minutes
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NGSS Standards

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

3-LS4-3 Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.

Crosscutting Concepts

Patterns Observed patterns in nature guide organization and classification and prompt questions about relationships and causes underlying them.

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

Related Resources

Pair With Intertidal Exploration Lesson

Overview

Animals and plants have unique adaptations to survive in the intertidal zone.

Objectives

- Students will understand the challenges of surviving in the intertidal zone.
- Students will create an animal specially adapted to survive in the intertidal zone.
- Students will recognize the unique adaptations of intertidal creatures.

Materials

- ☐ Paper
- ☐ Pens or Pencils
- ☐ Miscellaneous Art, Craft, and Household Supplies
- ☐ Envelopes
- ☐ Stamps

Background

Many intertidal invertebrates were heavily impacted by the *Exxon Valdez* oil spill and ensuing clean-up. Life in the intertidal presents many challenges even without an oil spill, and animals and algae living there have developed many adaptations to address these challenges. Invent an Invertebrate asks students to focus on some of these stressors and examine how organisms might be adapted to them. This activity is an excellent way for students to review the adaptations that they learned about during intertidal exploration activities and to

Notes

synthesize their knowledge. If appropriate for your class, you can ask students to give their animal an adaptation to deal with human impacts like oil or marine debris.

Preparation

Compile a bin of assorted kitchen, household, recreation, and/or craft items: sponges, spatulas, whisks, tongs, sheets, feather dusters, scarves, fabric scraps, ribbons, scarves, helmets, gloves, knee pads, etc. The materials can either be for a costume version or a craft version of the activity (details below).

Introducing the Lesson

Have the class brainstorm a list of the challenges an organism faces living in a coastal habitat. You may want to distinguish between challenges faced in any coastal habitat and challenges unique to specific habitats. For example, "avoiding being eaten" is general to all habitats, but "avoiding being washed away by waves" is more specific to rock and sand coast habitats. This is a great time to brainstorm and review some of the real-life adaptations already encountered in the intertidal zone.

Activity

1. Choose 3-8 challenges that each invented invertebrate will have to address through adaptations (avoiding predation, getting food, staying wet, large waves, etc.) If you would like, you can ask students to give their invertebrate one or more adaptations for dealing with human impacts (oil spills, marine debris, etc.)
2. Break students into 3-5 groups.
3. Challenge students to work with the materials provided to design and construct a never-before-seen animal that is adapted to the conditions and challenges of a specific coastal habitat recently visited (sandy, rocky, salt marsh, or tidal mudflat).
4. Decide whether students will be creating the creature using only the props provided (art/craft activity) or by dressing up a member of the group as the organism (fashion show activity). Have students sketch and list the name and adaptations for their group's invertebrate.
5. Each group should present their organism to the class and discuss the animal's adaptations to the intertidal zone. If you have chosen to have students dress up a member of their group, be prepared for (and encourage!) some silliness.

Wrap-up

Discuss why adaptations are important and how animals use adaptations. Remind students that adapting to physical or biological stresses and opportunities takes place over hundreds or thousands of years. An animal can't just adapt overnight to a challenge like an oil spill, but people CAN adjust their behaviors and habits very quickly. Ask students to brainstorm a list of ways they could adjust their own behavior to reduce the human impact challenges encountered by organisms in local ecosystems. Have students write a letter to themselves about one behavior they will change. Return or mail the letter to students a few weeks or months later.

Assessment

Before each group presents, instruct them to share how they decided what adaptations to give their new organism and the factors that were considered. First, ask students to construct an argument for how their organism uses specific internal and external structures to perform specific functions. Instruct them to use evidence from real animals to support their argument that their invented invertebrate could use the structures in those ways. Similarly, ask them to explain how their organism is especially well-suited to survive in the specific intertidal habitat, using evidence from real animals, examples of the stresses of the intertidal zone, and the potential ways the structures they've given their animal could function. You may choose to also have students individually respond to these prompts in their science notebooks.

Pair With

- Intertidal Exploration Lesson Plan