CREATE-A-CRITTER *Part One*

Topic
Adaptations, Change

Duration
Two sessions

Vocabulary
adapt
adaptation
ecosystem
environment
pollution
predator
prey
salinity

STANDARDS

Practices
Engaging in Argument from Evidence

Core Ideas
Structure and Function

Crosscutting Concepts
Cause and Effect

OCEAN LITERACY PRINCIPLES

OLP 5

Focus Question

What is an adaptation?

Overview

Students recall the different challenges living organisms encounter at the rocky shore. Students discuss the definition of adaptation. Students generate a list of possible adaptations living organisms may have to survive the different challenges of the rocky shore ecosystem. Students design and create a fictitious organism with adaptations that would allow it to survive the rocky shore ecosystem. Lesson 7 and Lesson 19 are connected lessons which teachers can utilize as formative pre- and post-assessments.

Objectives

Students will be able to:

- ★ Identify the term "adaptation"
- ★ Recognize the challenges living organisms encounter at the rocky shore
- ★ Construct a fictitious rocky shore organism with adaptations

Materials Needed

- ★ Rocky Shore Ecosystem Challenges activity sheet, page ___ (one per student)
- ★ Create-A-Critter Design activity sheet, page ___ (one per student)
- ★ 5 index cards per student
- ★ Scissors (one per student)
- ★ Transparent adhesive tape / tape dispensers (one per group)

Teacher Preparation

1. Each student will need a copy of the Rocky Shore Ecosystem Challenges activity sheets and the Create-a-Critter Design activity sheet (pages 59–60, 61).
2. Separate index cards into groups of five for each student.
3. Prepare scissors—one per student.
4. Prepare transparent adhesive tape dispensers so there are enough dispensers for student groups of three to four students per group.
5. Teachers will need easy access to a whiteboard or interactive whiteboard to record student input.

Teacher Tips

- ★ Have students share their "critters" by doing a class walk—have students leave their critters and design sheets on their desks and visit each other's creations.
- ★ Borrow tape dispensers from other teachers for this one class session to save time and money.

Extension Suggestions

- ★ Have students create a zoo plaque for the critter they created. Have students include the name of the critter, a Latin name, habitat, size, appearance, diet, threats, etc. Show students photos of plaques of animals found at zoos. Students could also include drawings of their critters as well as a map of the world indicating where their critters can be found.

Background

An adaptation is a body part or a behavior that helps a living thing survive in its environment. Rocky shore organisms need adaptations to survive the harsh and constantly changing environment of their rocky shore ecosystem. These challenges include some of the following: the waves, the tides, the temperatures, finding food, and evading predators. Other challenges to rocky shore organisms include the flux of salinity levels of the saltwater, various ranges of light, as well as human factors such as pollution and carelessness when visiting the rocky shore.

Some adaptations of rocky shore organisms include: thick shells, round shells, impermeable shells, the ability to retain water, holdfasts, secreted substances that allow organisms to attach well to rocks, spiny bodies, regeneration, exoskeletons, gathering in groups, camouflage, filter feeding, seeking crevices for shelter, burrowing abilities, ability to lower metabolic rates, and many more!

Procedure

Part One

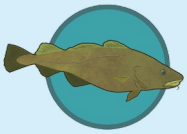
1. Ask students what humans do differently to adapt to winter weather. Have students share their answers.
2. Inform students that to adapt means to change something about your appearance, behavior or surroundings in order to make living and surviving easier.
3. Have students refer back to the inferences they have made over the past few lessons of how rocky shore organisms can survive their constantly changing ecosystem.
4. Inform students that rocky shore organisms all have something called adaptations—body parts or behaviors that help a living thing survive in its environment.
5. Have students get into groups of three or four to fill out the Rocky Shore Ecosystem Challenges activity sheet (page 60).
6. When students complete their lists, have them share their inferences and record them somewhere for all students to see. Save this list to share with the class for a future lesson! Students may bring their own sheets home, or paste them into their science notebooks (if applicable).

Part Two

7. Inform students that they are going to be creating a fictitious rocky shore organism that can survive the challenges of the rocky shore.
8. Inform students that they will be creating their "critter" with only five index cards, scissors and tape.

Books

- ★ *Crabby and Nabby: A Tale of Two Blue Crabs* by Suzanne Tate
- ★ *Spiny Sea Star: A Tale of Seeing Stars* by Suzanne Tate



Websites

- ★ Check out the Crash Course Kids YouTube Channel episode titled Living Things Change which answers the question, "What can happen to living things when the world around them changes?"
- ★ Watch a BrainPOP video on ecosystems and take the quiz! (Subscription required.)

Scientist Notebook

- ★ Students can record the definition of adaptation, ecosystem and environment. Students can paste the *Rocky Shore Ecosystem Challenges* activity sheet into their notebook.

Procedure (continued)

9. Review the Create-a-Critter Design activity sheet (page 61) with students.
10. Have students get back into their previous groups if they are not in them already so that they can share transparent adhesive tape/tape dispensers.
11. Have students create their rocky shore organisms and complete the Create-a-Critter Design activity sheets.
12. If there's time, have students share their critters and their critters' adaptations with either their groups or the entire class.
13. Collect the Create-a-Critter Design activity sheets and the students' critters for a future lesson. If desired, you can display their critters.

Wrap-up

- ★ Ask students to identify the main challenges rocky shore organisms encounter regularly.
- ★ Ask students to define "adaptation."
- ★ Remind students that adaptations are the body parts or behaviors that rocky shore organisms use to live or survive easier in their constantly changing ecosystem.

ROCKY SHORE ECOSYSTEM CHALLENGES

Name: _____

Date: _____

The chart on the next page lists five of the main challenges rocky shore organisms encounter in their effort to survive. Rocky shore organisms have adaptations that enable them to survive these challenges.

With your group, come up with a list of adaptations you think rocky shore organisms may have to survive their rocky shore ecosystem.

Tip for Students: Take turns sharing your ideas by choosing one person to start the list with one idea. Continue to share ideas by having each student share one idea, taking turns in a clockwise direction.

Challenges

Waves

Waves are constantly beating against the rocky shore. Sometimes the waves are small and gentle and sometimes the waves are large and strong. This means waves can be crashing into organisms above land, or causing the water to move around organisms living under the water.

Tides

Tides cause the level of the ocean to rise and fall twice a day. This means that some organisms spend part of the day living above the water and part of the day living under the water.

Changing Temperatures

The temperature of the rocky shore's ocean water, rocks and sand, and air can change a lot during the day and throughout the year. This means organisms need to be able to survive both warm and dry conditions, and cold and wet conditions.

Finding Food

Food can be difficult for organisms to find or eat because different types of prey have adaptations that help them hide well or allow them to defend themselves well. It can also be difficult to find food because the constant changing of the environment can move organisms away from food sources (or food sources away from organisms).

Avoiding Predators

Predators can be difficult to avoid because they have adaptations that help them hunt well. It can also be difficult to avoid predators because the constant changing of the environment can expose organisms to predators.

ROCKY SHORE ECOSYSTEM CHALLENGES

Name: _____

Date: _____

Adaptations	Waves	Tides	Changing Temperatures	Finding Food	Avoiding Predators
	1.	1.	1.	1.	1.
	2.	2.	2.	2.	2.
	3.	3.	3.	3.	3.
	4.	4.	4.	4.	4.
	5.	5.	5.	5.	5.

CREATE-A-CRITTER DESIGN

Name: _____

Date: _____

Draw a sketch of your critter here.

Your critter's species: _____

(for example: snail, crab, fish)

Your critter's name: _____

Your critter's adaptations:

1. _____
2. _____
3. _____
4. _____
5. _____

How do your critter's adaptations help it survive?

_____

_____

_____

_____