

ROCKY SHORE ZONES: THE SUBTIDAL ZONE

Topic

Zones, Adaptations

Duration

Two sessions

Vocabulary

adaptation
challenge
feature
subtidal zone
zone

STANDARDS

Practices

Analyzing and Interpreting
Data

Core Ideas

Adaptation

Crosscutting Concepts

Systems and System Models

OCEAN LITERACY PRINCIPLES

OLP 5

FOCUS QUESTION

What is the subtidal zone?

OVERVIEW

Students recall that the rocky shore has been divided into zones by marine biologists based on the average water and air exposure of each area. Students discuss what they learned about the splash zone, upper, middle, and lower intertidal zones, and the subtidal zone. Students record information about the subtidal zone's names, features, common algae life, and common animal life. Students continue to construct a bulletin board diagram or individual rocky shore zone diagram by creating the subtidal zone using art supplies.

OBJECTIVES

Students will be able to:

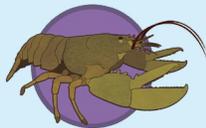
- ★ Indicate that the rocky shore can be divided into zones
- ★ Identify the subtidal zone and its features
- ★ Recognize the challenges living organisms encounter in the subtidal zone and the different adaptations of organisms living in the subtidal zone
- ★ Create a subtidal zone using art supplies.

MATERIALS NEEDED

If doing bulletin diagram activity:

- ★ Rocky Shore Zones Table (one per student, page 143)
- ★ Atlantic Ocean Rocky Shore Guide (one per student, pages 18–20)
- ★ Rocky Shore Zones Table Answer Key (for teacher reference, page 144)
- ★ Life at the Rocky Shore Fact Sheet (for teacher reference, pages 16–17)
- ★ A large bulletin board or blank wall
- ★ White bulletin board art paper
- ★ White paper / index cards for each student
- ★ Coloring utensils for each student





Teacher Tips

- ★ Have students use the Atlantic Ocean Rocky Shore Guide as a reference while they draw their rocky shore organisms. Use book illustrations or other printed resources if you need more examples.
- ★ While instructing students about the subtidal zone using the Rocky Shore Zones Table, either project a copy of the table on the board or draw a table on a whiteboard to record information for all students to see.
- ★ Make copies of the Rocky Shore Zones Table Answer Key for students with special needs to use at their own desks to either copy or highlight.

MATERIALS NEEDED (CONTINUED)

- ★ Scissors for each student
- ★ Stapler (for teacher)

If doing individual diagram activity:

- ★ Rocky Shore Zones Table (one per student, page 143)
- ★ Atlantic Ocean Rocky Shore Guide (one per student, pages 18–20)
- ★ My Rocky Shore Diagram (one per student, page 70)
- ★ Rocky Shore Zones Table Answer Key (for teacher reference, page 144)
- ★ Life at the Rocky Shore Fact Sheet (for teacher reference, pages 16–17)
- ★ Coloring utensils for each student

TEACHER PREPARATION

For the large classroom diagram:

1. Make sure all students have copies of the Rocky Shore Zones Table and Atlantic Ocean Rocky Shore Guide.
2. Thoroughly review the Rocky Shore Zones Table Answer Key and Life at the Rocky Shore Fact Sheet.
3. Prep scissors, drawing utensils, and white paper/index cards for each student.

For the individual student diagram:

1. Make sure all students have copies of My Rocky Shore Diagram, Rocky Shore Zones Table, and Atlantic Ocean Rocky Shore Guide.
2. Thoroughly review the Rocky Shore Zones Table Answer Key and Life at the Rocky Shore Fact Sheet.
3. Prep drawing utensils for each student.

BACKGROUND

The rocky shore ecosystem is naturally divided into zones by the tidal movement of the ocean. These zones are mainly defined by the amount of time they are exposed to water and air. Specific organisms can often be found inhabiting particular zones.

Although types of living organisms are often found in one specific zone, they can be located in different zones depending on their ability to survive in various regions of the rocky shore. Zones are not restrictive, and will vary tremendously by slope, exposure, size of loose rocks, etc. While using the term “zone” is common and helpful, it can also mislead if students think that barnacles can only exist in the “barnacle zone.”





Extension Suggestions

- ★ Have students research an ocean animal and write a story about the animal. Use Suzanne Tate's stories, along with Nancy Donovan's story Oscar the Herring Gull as examples. Consider using the template provided (pages 145–151) to help students format their story. Use websites such as National Geographic for Kids and Animal Fact Guide for research. Consider having students pick names of animals out of a hat to determine which animal they research, giving them one or two chances to “trade” for an animal of their choice afterward.
- ★ Invite a younger classroom to go on a pretend field trip to your classroom's finished rocky shore bulletin board (or individual diagrams) project. The younger classroom could fill out pretend permission slips, and your students can play the role of rocky shore guides.

BACKGROUND (CONTINUED)

Each rocky shore zone presents living organisms with challenges that risk their survival. These living organisms have adaptations that enable them to overcome these challenges and thrive in the rocky shore ecosystem conditions.

The rocky shore ecosystem is frequently divided into three zones: the upper intertidal zone, the middle intertidal zone, and the lower intertidal zone. This ecosystem can be divided more precisely into five zones: the splash zone, the upper intertidal zone, the middle intertidal zone, the lower intertidal zone, and the subtidal zone.

PROCEDURE

Part One

1. Ask students if they can recall how the rocky shore is divided into zones.
2. Inform students that a zone can be an area of land that has particular features. Each zone of the rocky shore has particular features, including specific amounts of time they are exposed to air and water, specific living organisms, and specific challenges to an organism's survival.
3. Have students discuss what they have learned about the splash zone, upper, middle, and lower intertidal zones by referring to their Rocky Shore Zones Table.
4. Inform students that they are going to be learning about the subtidal zone.
5. Instruct students on the names, features, algae, and animal life of the subtidal zone, having each student record facts you provide them with in their Rocky Shore Zones Table.
6. Emphasize the challenges to life in the subtidal zone, specifically citing the organisms' adaptations that allow them to survive these challenges.

Part Two

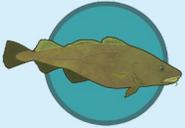
7. Inform students that they are going to continue to work on their rocky shore diagram, either as a class or individually.
8. *If as a class:*
 - a. Have students access their Atlantic Ocean Rocky Shore Guide.
 - b. Provide each student with white paper or index cards, scissors, and drawing utensils.
 - c. Divide students into groups and designate each group specific organisms to draw and color for the subtidal zone.
 - d. When finished, have students cut out their organisms and the teacher will attach them to the bulletin board or wall diagram.





Books

- ★ *Lindie Lobster* by Suzanne Tate
- ★ *The Cod's Tale* by Mark Kurlansky



Websites

- ★ Watch National Geographic Kids Nature Boom Time's YouTube episode titled "Kelp Forest."
- ★ Watch PBS Kids Wild Kratt's YouTube episode titled "Swimming with the Lobster."
- ★ Watch the Gulf of Maine Research Institute's YouTube episode titled "Blue lobster molting."



Scientist Notebook

- ★ Students can record the challenges and adaptations of organisms found at the subtidal zone.

PROCEDURE (CONTINUED)

If individually:

- Have students access their Atlantic Ocean Rocky Shore Guide and My Rocky Shore Diagram.
- Inform students that they are going to draw the specific organisms of the subtidal zone onto their My Rocky Shore Diagram.

WRAP-UP

- ★ Have students store their Rocky Shore Zones Table, Atlantic Ocean Rocky Shore Guide and My Rocky Shore Diagram (if applicable) in a secure place to refer to in upcoming lessons.
- ★ Have students recall the features of the subtidal zone and its living organisms.
- ★ Have students recall the specific adaptations of the subtidal zone organisms.



ROCKY SHORE ZONES TABLE

Name: _____

Date: _____

Name of Rocky Shore Zone: _____

Zone Name	
Zone Features	
Zone Algae	
Zone Animals	



ROCKY SHORE ZONES TABLE

Answer Key

Name of Rocky Shore Zone: Subtidal zone

Zone Name	
	Subtidal zone
Zone Features	
	This zone is always exposed to water.
Zone Algae	
	Irish Moss, Horsetail Kelp, Sugar Kelp, Shotgun Kelp, Bubblegum Kelp
Zone Animals	
	Mummichog, Rock Gunnel, Lumpfish, Cunner, Lobster, Jonah Crab, Orange Sheath, Golden Star



WRITE YOUR OCEAN ANIMAL STORY

Name: _____

Date: _____

Draw a picture of your animal:



Describe your animal

Size (weight, height): _____

Color: _____

Special Characteristics (what makes your animal unique):

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____



Write Your Ocean Animal Story (continued)

Setting (where your animal lives): _____

Draw the setting of your story:



Food (what does your animal eat?):

1. _____

2. _____

3. _____

Dangers (predator, boats, etc.):

1. _____

2. _____

3. _____



Write Your Ocean Animal Story (continued)

Your character's name: _____

Descriptive words of your character:

1. _____

4. _____

2. _____

5. _____

3. _____

6. _____

Your character's problem (predator, some sort of danger: _____

What does the problem look like?

How does your character solve the problem? (With a special characteristic? A human's help?) _____



Your Ocean Animal Story

- ★ Your quest is to write a story about an ocean animal.
- ★ A good story has a beginning, middle and end.
- ★ A good story has a problem and a solution.
- ★ Enjoy learning about your animal, and then create a main character.
- ★ Educate your reader by writing an exciting story that has many facts about your animal.

