



LESSON 5

Rocky Shore

Kindergarten to Grade 3

Objectives

- To compare animals that live in the high and low tide zones.
- To understand challenges for animals that live on rocky shores.
- To act out what rocky shore animals do at high and low tides.
- To compare the rocky shore to mud flat and sandy beach habitats.

Materials

Video: *Biology of the Seashore* by Biomedica Associates (www.ebiomedica.com).

Video: *The Biology of Molluscs* by Biomedica Associates.

Video: *The Biology of Echinoderms* by Biomedica Associates.

Cards with pictures or photos and information about the animals and which tide zone they live in. (can use *Ocean Animal Clue Cards* or the book *Once Upon a Seashore* by Gloria Snively): shore crab, barnacle, mussel, anemone, limpet, sea cucumber, sea star, kelp, whelk, tidepool sculpin, decorator crab and sea urchin.

Shells: Sea Urchin Test, Limpet shell, Barnacle Shell, Mussel Shells, etc.

Container with rocks and water in it (to demonstrate low and high tide).

Concepts

- The greatest variety of animals lives on the rocky shore because of the variety of habitat available.
- There are many challenges to living on the rocky shore.
- Animals live in different tide zones depending on their adaptations to survive.
- Rocky shore animals have a variety of ways to attach themselves to rocks.

Activities

1. Introduction to the rocky shore

Demonstrate high and low tide by pouring water over rocks in a container and holding it at an angle so the water covers and uncovers the rocks. Let students try it too. Have them think about where animals may want to be when the tide comes in or goes out.

The rocky shore has more types of habitats than any other type of seashore and it has the greatest variety and number of animals.

Why is the rocky shore home to the greatest variety of animals and plants?

A: It is stable and has many types of habitats. Animals can live on the top, side or bottom of the rocks or in between rocks.

Do these rocky habitats occur on a mud flat? A sandy beach?

A: No, there are few large rocks for animals to attach to.

2. Inhabitants of the rocky shore

Where have you seen animals on the rocky shore? What are some of the animals you have seen?

A: Animals occupy every available space including on or under rocks, in crevices, in tide pools, among seaweed. Animals include anemones, crabs, sea stars, mussels, barnacles, limpets, snails, etc.

What is good beach etiquette when looking at animals on the rocky shore?

A: Make sure you replace rocks very carefully back where you found them. If rocks stay turned upwards, the creatures that were underneath can dry out and die. Think of the rock as a house that needs to stay right side up.

Watch the following video clips to show some of the animals that live on the rocky shore and how they behave:

- The rocky shore section of the video *Biology of the Seashore*;



- The sea star, sea urchin and sea cucumber sections of *The Biology of Echinoderms*; and
- The octopus movement and mussel making byssel thread sections of *The Biology of Molluscs*.

3. Adaptations to living on the rocky shore

Brainstorm different challenges to survival on a rocky shore.

A: Salinity, water, space, predators, wave action (must be able to attach or hide), limited time to gather food, sun (drying out)

Think of some different ways that rocky shore seaweed and animals attach themselves to rocks.

Kelp – holdfast;

Sea stars, sea urchins, sea cucumbers – tube feet;

Barnacles – cement;

Chitons, limpets, whelks – a strong foot that suction to the rocks;

Mussels – strong threads that attach to rocks

Some animals don't attach to rocks. Instead they hide underneath or between rocks. Can you think of animals that do this?

A: Shore crabs, porcelain crabs, blennies, six-rayed sea stars, leaf worms, nudibranchs, etc.

4. Being animals on the rocky shore

Have students act out what animals and seaweed do at high and low tide. Start and end with a stationary creature like a barnacle or a slow-moving one like a limpet that always returns to the same place on a rock.

For example:

- *Periwinkles move slowly on their one foot. They drill a hole in the shell of their predators to eat them.*
- *Isopods have lots of legs. They move around and eat seaweed. Rockweed is their favourite. They are the same colour as seaweed.*
- *Barnacles cement their heads to a rock and then use their legs to draw in their food.*

- *Limpets move slowly on their one foot and scrape algae off the rocks. They always return home to the same spot at the end of the day.*
- *Hermit Crabs don't have their own shells. They have to find an old snail shell and have to find bigger and bigger shells as they grow. They use their large front claw as their front door.*
- *Sea urchins move on their tube feet and use the five teeth on their underside to munch on kelp.*
- *Sea anemones use their stinging tentacles to paralyse their prey. They close up when the tide is low.*
- *Decorator crabs put seaweed on their backs which is great camouflage but they can also pick up a snack if they are hungry.*
- *Sunflower stars are voracious predators, They will eat almost anything dead or alive including other sea stars. They are also the fastest sea star around and grow up to 24 legs!*

Discuss tide zones and some of the animals that live in each zone:

- Spray zone – periwinkles, isopods
- High Tide Zone – barnacles, limpets, hermit crabs
- Low Tide Zone – Sea urchin, sea anemones, decorator crab, sunflower star

Why don't decorator crabs live in the spray zone?

Why don't isopods live in the low tide zone?

Conclusion

- Review the challenges for animals living on the rocky shore.
- Compare rocky shore animals to sandy beach and mud flat animals. Review what the jars of sand and mud were like. How is a sea anemone different from a mud shrimp and a moon snail? Could a sea anemone live in a mud flat or sandy beach? Why not?