



LESSON 5

Rocky Shore

Grades 4 to 7

Objectives

- To compare animals that live in the high and low tide zones.
- To understand challenges for animals that live on rocky shores.
- 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 these animals and which tide zone they live in (can use *Ocean Animal Clue Cards* and 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.

Flagging tape.

Cards labelled: Splash Zone, High Tide Zone, Middle Tide Zone, Low Tide Zone.

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

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

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 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. Tide zones on the rocky shore

The rocky shore can be divided into zones or areas according to the length of time it is covered by water and exposed to air.

Watch the tide zone section of the video *Biology of the Seashore*.

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

- Spray zone – periwinkles, isopods
- High Tide Zone – barnacles, hermit crabs, shore crabs (in tide pools)
- Middle Tide Zone – limpets, chiton, mussels, rockweed, whelks, shore crab, sea star, sea lettuce, red laver seaweed
- Low Tide Zone – Dungeness crab, red rock crab, sea urchin, sea anemones, kelp crab, decorator crab, sea cucumber, sunflower star, nudibranch,

Divide the classroom into tide zones using flagging tape and cards – spray zone, high tide zone, middle tide zone and low tide zone.

Hand out animal cards to students making sure there are animals from each zone. Students move to the tide zone that their animal lives in and can see other animals that live in the same zone.

4. 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.

Conclusion

- Review the different tide zones and what animals live in each zone.
- Review the challenges for animals on the rocky shore.
- Compare rocky shore animals to sandy beach and mud flat animals.
Rocky beaches have the most variety of animals because of the variety of habitats. In a mud flat or sandy beach, animals live under the mud or sand. They may also move with the tide on a sandy beach. Is there much food in a mud flat or sandy beach? Oxygen? Remember what the sand and the mud in the jar was like?
- Draw a rocky shore with animals in each of the tide zones. Label each tide zone.