



DRYING OUT ON THE ROCKY SHORE

This lesson plan developed by:



Overview:

The intertidal zone, the area between high and low tides, is a harsh and unforgiving habitat, being exposed to the rigors of both the sea and the land. Intertidal species have developed adaptations to survive the extreme changes in salt concentrations, drying out, sun exposure and other varying conditions. Students will mimic how marine creatures have adapted to survive the extreme conditions between the tide marks on the rocky shoreline.

Materials:

- Two cups or bowls
- Salt
- Tap water
- Several sheets of paper towels
- Small containers with lids
- Scissors
- Pencil or crayon

Duration:

60-90 minutes over the course of a day

Physical Activity:

Moderate

Background:

Life is challenging between the tide marks on the rocky shore. Crashing waves, drying sun, varying salt concentrations and changing tides set the conditions for life along the shores; here,

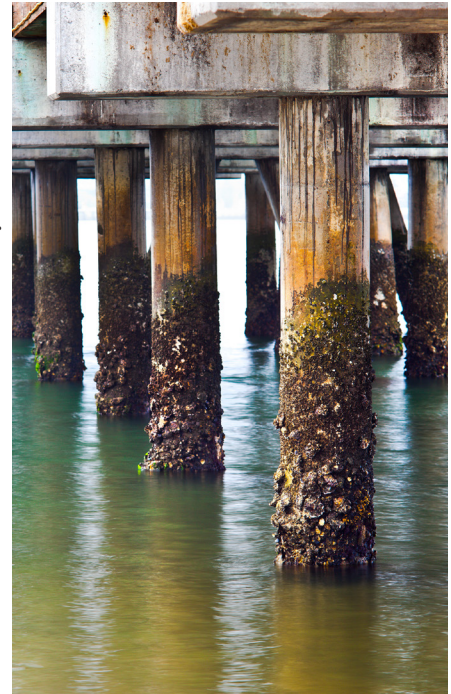
Drying Out on the Rocky Shore (cont.)

as on the wharf pilings, plants and animals aren't randomly distributed but occur in bands or zones.

The high-tide zone is more land than sea; only a few specially adapted plants and animals can survive. The plants and animals that live here receive most of their moisture through wave splash. To avoid drying out, barnacles close their shells and limpets go out only at night.

In the mid-tide zone lives a diverse group of animals and plants, including seaweeds, mussels and sea stars. Community members must find ways to stay moist when the tide is out, avoid predators when the tide is in and compete with each other for space.

The low-tide zone is exposed to air only during the lowest tides. As they're usually covered by water, the sessile (attached) organisms are subject to predation by sea stars, fishes and seabirds that use shallow waters.



Activity:

Describe the goal of having students model adaptations used by intertidal organisms to keep from drying out. In one bowl, add just freshwater. In the second bowl, create seawater with one cup of tap water and about one tablespoon of salt. After showing them the materials, ask students to design a way to model and test rates of drying in different conditions.

1. If you want to give more guidance, have students follow these steps. Students may work individually or in pairs. Ideally, this should be approached as an inquiry activity, with students proposing models for intertidal organisms and outlining testing procedures.
2. Tear each sheet of paper towel into four pieces. Using crayon or pencil, give each piece a different number or letter.
3. Experiment with folding the pieces into different sizes. Wad up some pieces into tight balls, fold some a few times and fold some not at all. Dip some in the freshwater and some in the saltwater. Place some in the small sealed containers and leave some exposed to the air. Leave some in a sunny spot and some in the shade.
4. Ask student to predict:
 - What do you think will happen?
 - Which ones will dry out the fastest?
 - Which will dry the slowest?
5. Make a chart to record your experiments. Going down the left side of your paper, list what you did to the paper towel. Across the top, make two columns: your guess and what actually happens.
6. Now leave your pieces for one hour, six hours and one day. Compare the different pieces to the shapes of tide pool animals.

Drying Out on the Rocky Shore (cont.)

Discussion:

As a group, discuss your findings with the following questions:

- Are any pieces similar to the way an animal finds cover at the seashore?
- Which of your towel pieces is like a seaweed?
- Which one is like a barnacle, a sea star, a mussel?
- How do these animals keep from drying out during low tide?

Additional Resources:

To learn more about the activity, check out our [Drying Out on the Rocky Shore “how to” video](#).

Ocean Literacy Principles:

Ocean literacy is an understanding of the ocean’s influence on us, and our impact on the ocean. There are seven [Ocean Literacy Essential Principles](#) that all people of our blue planet should have an opportunity to learn and understand. This activity touches upon the following Essential Principles:

5. The ocean supports a great diversity of life and ecosystems
7. The ocean is largely unexplored

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