

Intertidal Mural Activity

Created by Genevieve Black for Maine Aquaculture Innovation Center

Purpose:

For students to become familiar with different intertidal animals and seaweeds native to Maine, and see how these organisms sort themselves into zones based on their needs.

Standards:

5-LS2-1. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

Background for Educators:

Definitions:

Intertidal zone - The area of a beach between low tide and high tide, the area exposed at low tide.

Zonation - In an intertidal zone there will be areas where one organism or a couple of organisms are more common than others creating zones on the beach.

Why does Zonation happen?

Some organisms have different needs than others, and are better able to compete in certain areas of the intertidal zone than others. For example: Barnacles are often found high on the beach because they are better able to withstand drying out than some other organisms, and it keeps them out of the reach of predators like sea stars longer because they cannot spend much time out of the water. Seaweeds have another factor that will impact their zonations, and that is their photosynthetic pigments. Water filters out sunlight, and how far that sunlight travels through water determines which wavelengths of light are filtered out. Seaweeds take advantage of this, and share space by sorting into areas where they are best able to absorb the wavelengths of light they need. Typically you will see blatterracks and rockweeds high on the intertidal zone, reds and green seaweeds will be farther down the beach, and kelps will be at the very end of the intertidal zone into water that allows them to be fully submerged much of the time. An example of a typical beach in Maine is given below.

Zonation of Maine's Rocky Intertidal Seaweeds

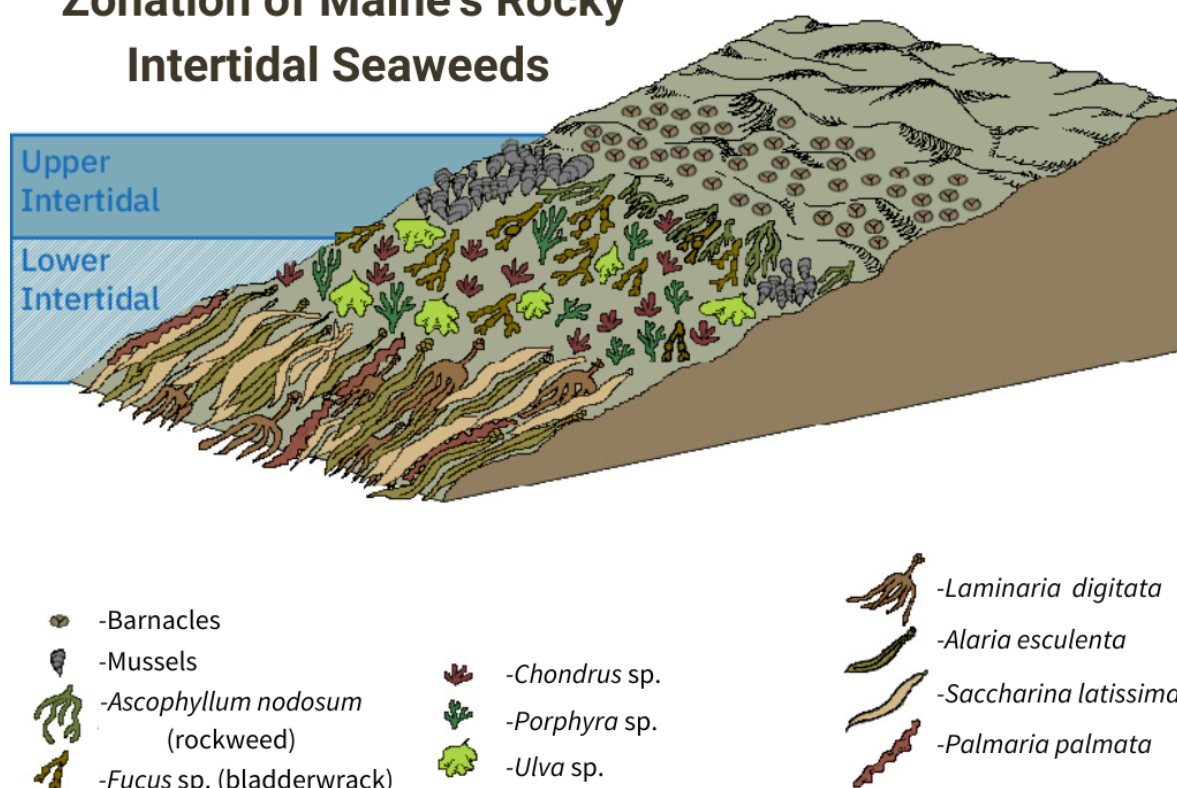


Image modified by Maya Pelletier for this project.

Materials:

- Attached coloring pages with enough copies for your class
- Large paper or white board to draw the intertidal zone profile on
- Coloring materials like markers, colored pencils etc.
- Tape or staples to attach colored intertidal organisms to the beach profile
- Scissors

Procedure:

- Draw intertidal beach profile similar to the above image on a white board or paper attached to a wall or bulletin board, whatever surface you will be using to create this. Your profile should include: The slope of the beach, the labels of upper intertidal and lower intertidal zone.
- Show students this video of an intertidal zone if your students are not familiar with beaches: <https://www.youtube.com/watch?v=-KFfKTjOumU>
- Have students color their set of marine organisms, they can use this seaweed ID guide from Maine Seaweed council to get accurate color images of each species: <https://www.seaweedcouncil.org/identifying-maine-seaweeds/>

- Once they are colored, students should cut out and place each species where they think they belong on the intertidal zone (it would be helpful to start with tape so they can be moved as students correct positions if applicable). As students place their seaweeds they should be asked why they think that species go where they want to put it, they can be drawing on personal experience, or the video resource.
- After the first placement as a group talk about any outliers that may be present. Correct positions of these organisms, and enjoy your intertidal mural.
- After the mural is complete, ask students to identify different components of the food system present here. Although all organisms in an intertidal zone are not present, you do have primary producers and primary consumers. You can ask students to brainstorm what might be a secondary consumer in an intertidal zone in Maine. Options include: crabs, whelks, sea stars, sea birds, even humans who harvest things like mussels.

Discussion questions:

1. Why do organisms sort themselves in an intertidal zone?
2. What is the source of energy for this ecosystem?
3. How does energy move through this ecosystem?