

Intertidal Zonation Worksheet

Intertidal animals and plants have to be very hardy to survive exposure to air, fresh water (rain and snow), summertime warmth and dryness, wintertime freezing temperatures, and predators from both the land and the sea. On the outer coast, they have to be able to hang on in pounding surf. Even in the more protected bays and inlets, fierce storms and waves occasionally flare up. There are benefits, too—the tide brings a fresh supply of rich food and nutrients twice a day. Each of the predators can reach them only at certain tidal stages—so there are periods of rest and recovery. Also, these tough intertidal conditions make it difficult for some species to compete for food and space. Each species of marine plant and animal has a particular tolerance to the hazards of being out of saltwater. By looking at the beach in a section from its highest high water mark down to the water level of a low, low tide, you can quickly begin to see major differences in plant and animal populations.

The Highest Fringe

At the upper limits of the intertidal zone, the fewest life forms are evident. You may notice that the rocks appear black here. This is because they are covered by a black encrusting lichen or by a blue-green algae that makes the rocks treacherous and slippery when wet. In these upper reaches, too, may be found the common tiny periwinkle—a fat, ridged snail that sometimes seems to pepper the rocks.

The Middle Zone

As you move toward the water's edge at low tide, you will be aware of obvious color bands or patches on the beach. There may be bands of *Fucus*, the common brown rockweed, and of blue-black mussels (the intertidal and subtidal bivalves that attach themselves by tiny threads to rocks, pilings and other surfaces), and barnacles. Here too, you will begin to see limpets, amphipods, various sea stars, tiny black sea cucumbers, and other forms of life not in evidence at higher levels.

The Lowest Zone

Approaching the water's edge, you will not find some of the plants and animals evident at higher levels. In general, however, the lower you go in the intertidal zone, the greater the diversity of life forms. Here you will find sea urchins, a wide variety of large sea stars, perhaps juvenile King crabs, large white or vari-colored sea anemones, and the larger snails.

Answer these Questions:

1. What are five reasons why it is difficult for marine plants and animals to live in the intertidal zone?

a.

b.

c.

d.

e.

2. What are two life forms you can find at the upper limits of the intertidal zone?

a.

b.

3. What are six life forms you can see in the middle zone?

a.

b.

c.

d.

e.

f.

4. What are five marine life forms that you can see at the lowest zone?

a.

b.

c.

d.

e.

5. Now think about the Exxon Valdez oil spill. What might be the effects of the oil on the beaches?

6. Which tidal zone(s) do you think would be impacted the most? And why?

7. Which invertebrates might be impacted?

8. Which vertebrates do you think might be impacted by oily beaches? (hint: think about the predator-prey relationships)

9. Make up a riddle or poem about your favorite intertidal creature and how they might be affected by an oil spill.

10. How can intertidal zones and organisms be protected from oil spills and pollution?