

# **Preventing water loss in the intertidal: Sponge Experiments**

## **An OPIHI Extension Activity**

Chela Zabin and Dawn Noelani Adams

### **Intertidal Organisms and Water Loss**

Nearly all intertidal organisms are thought to have evolved from subtidal marine ancestors. Many of them, such as the algae, anemones and the polyps of coral, don't have tough body parts to keep them erect in air; they require water for support. Other organisms require water currents to deliver food, remove waste products, or disperse their gametes or larvae. Nearly all of the intertidal animals extract oxygen by passing water over their gills. When they are exposed to sun, wind, and air at low tide, intertidal animals are faced with the problem of water loss through evaporation. How do intertidal organisms meet this challenge?

### **A Sponge Experiment**

Sponges will represent an intertidal organism. Organisms are largely composed of water, thus a wet sponge is a good model.

Take sponges of the same size and shape. Dunk each in water. Place them in different places and containers in your classroom. For instance, place one on a window ledge in the sun, another on the same ledge in the shade. Place a third and fourth in round Tupperware bowls without lids before putting them on the ledge (one in the sun, another in the shade). Place the last two sponges in Tupperware bowls with the lids on and then place them on the ledge (again, one in sun and one in shade).

Hypothesize:

- Which one will dry out first?
- Which one will stay wet the longest?
- Why do you think so?

What might the tupperware lids represent?

How might the weather affect our results?

Time how long each sponges takes to dry out. (Smaller sponges will dry out faster, thus allowing experiment to run to completion faster).

### **Further sponge experimentation:**

- Would a smaller sponge dry out before a larger sponge?
- What about a very thin sponge vs. a sponge with the same volume but a more compact shape?
- What about a sponge encased in plastic wrap vs. one in Tupperware?

After some experimentation, have the students try to build the best water-holding “animals.” Hypothesize as a class which “animal” might stay wet the longest, then you can compete!

- If our sponges could move, what behaviors might they want to have to prevent water loss?
- The just because a sponge animal cannot hold water the longest does not mean it does not live in the intertidal. The intertidal has different areas, from the upper splash zones to the lower zones that are only exposed during low tide. Where might each different type of sponge animal live? Why?

\*You can also do this activity on one or your intertidal field trips, where you can also look for different types of animal morphology (analogous to our tupperwares with lids, without lids, and regular sponges) in different zones of the intertidal.