LESSON 7
Sponges and Sponge Reefs
Grades 4 to 7

Objectives
- Explain why sponges are animals and be able to name at least one type of sponge.
- Name what sponges eat and name at least one predator of sponges.
- Explain how sponges protect themselves.
- Show the location of the Hecate Strait Sponge Reefs off Haida Gwaii.

Materials
Video: Sponge Reef Video footage from the Geological Survey of Canada at the Institute of Oceans Sciences in Sidney, BC.

Station 1: Dried sponges samples; Magnifying glass; Shell with holes from boring sponge; Pictures of different sponges from book Whelks to Whales: Coastal Marine Life of the Pacific Northwest by Rick Harbo, 1999.

Station 2: Picture of hermit crab with sponge for home instead of shell; Sample of dried sponge that hermit crabs live in and carry around.

Station 3: Close up drawings or photo of sponge spicules (pp 88 to 90 of textbook Living Invertebrates by Pearse and Buchsbaum, 1987); Picture of fossilized spicules from a glass sponge.

Station 4: Pictures of sponge predators and their prey; Drawing of parts of the sponge.
Station 5: Canadian Parks And Wilderness Society (CPAWS) Hecate Strait Sponge Reefs postcard; Glass Sponge Gardens brochure or website: mareco.org/khoyatan/spongegardens; Sample of dried glass sponge if available.

Concepts
- The glass sponge bed reefs in Hecate Strait, off Haida Gwaii, are unique in the world.
- Sponges are animals even though they are not like most animals we know.
- Sponges can be many different shapes, colours and sizes.
- Some sponges and hermit crabs may have a symbiotic relationship.

Activities

1. Introduction
We are going to study an animal today that has no eyes, no nose, no mouth, no legs, and no heart. In fact, it has no organs and yet it is an animal – The sponge. Scientists a long time ago thought it was a plant because it didn't seem to move but later they realized it was an animal. It does not make its own food like plants do and it takes in food by using cilia (little hairs) in its pores that pull in water and zooplankton. It can't run so luckily it doesn't have too many enemies, but some animals do like to eat it. It protects itself by either tasting bad, smelling bad and/or by having spines.

2. The Hecate Strait Sponge Reefs
Why learn more about sponges? Well we have 4 sponge reefs near Haida Gwaii that are unique in the world. There are no other reefs like this anywhere else in the world. They are 9000 years old and up to 21 metres high. The new sponges grow on top of the 'skeletons' of old sponges. An individual sponge can live to be a few hundred years old. The sponges that make up the reef are called glass sponges. They use silica (the same material humans use to make glass) to make spicules that protect them from predators. The spines will actually stick into an animal unless the animal has a hard shell or thick scales. Not all sponges have sharp spicules. Some are actually collected and dried to be used as bath sponges.

A German scientist named Manfred Krauter was studying fossils of glass sponges. He didn't know there were living sponges right here. He came to BC and went to the depth of 200 metres in a submersible to see the sponges.

Show video of the glass sponge reefs.

Explain that if the sponge reefs are torn off the bottom of the ocean floor, they do not grow back. The conditions have to be just right for them to form. The sponge reef areas are now closed to trawl fishing (draggers), but to truly protect the reefs they should be made a marine protected area.

Activities Stations

Set up the 5 activity stations. Divide the class into 5 groups and rotate through the stations.

Details of each Station are in the accompanying Worksheet for Lesson 7. The answers to the questions are in italics.

Conclusion

- Compare dinosaur fossils to sponge fossils. What parts fossilize?
- Locate the sponge bed reefs on the map.
- Give examples of types of sponges and sponge predators.
- Discuss what and how sponges eat.
- Discuss why an area like the sponge bed reefs should be protected.

Extension Activity

Take the Sponge True/False Quiz on page 53 of Thomas M. Niesen, *Beachcomber's Guide to Marine Life of the Pacific Northwest*, Gulf Publishing Company, 1997.

Marine Matters **Curriculum 3**
Lesson 7 • Sponges and Sponge Reefs • Grades 4 – 7

Activity Station Worksheet

(Answers are in italics.)

Station 1. Sponges

Write the name of one type of sponge. Draw it.

Station 2. Hermit Crabs and Sponges

Why do some hermit crabs choose a sponge house instead of a shell house?

The advantage for a hermit crab is that the sponge is lightweight and it doesn't have to keep looking for larger shells as it grows. Sponges may also protect the crab because sponges don't have many predators.

How does the hermit crab help the sponge?

The advantages for the sponge are that it gets to travel so may have access to more food than if it had to stay in one place and it can move away from predators.

Draw a hermit crab in a sponge house.

Activity Station Worksheet

(Answers are in italics.)

Station 3. Sponge Fossils

Are there fossils of whole sponges? What parts of a sponge might be fossilized?

There are no fossils of whole sponges because the bodies of sponges are soft. Only the sponge spicules of glass sponges fossilize.

Station 4. Sponge Predators

Draw a sponge predator.
Examples of sponge predators are blood sea stars, leather stars, black katy chitons, sea lemon nudibranchs (sea slugs), and leopard dorid nudibranchs.

Draw sponge food.
Sponge eat zooplankton that they filter out of sea water.

Station 5. Hecate Strait Sponge Reefs

Look at where the sponge reefs are located. They are unique in the world. Circle where they are on the map. How many are there?

There are 4 known sponge reefs.