



Science Unit: *Discovering Life in Local Habitats*

Lesson 5: *Beach Life: Clam Dissection*

School Year: 2009/2010
Developed for: Weir Elementary School, Vancouver School District
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Grade level: Presented to grades 1 and 2; appropriate for grades K – 7 with age appropriate modifications
Duration of lesson: 1 hour and 15 minutes

Objectives

1. Discover that inside a familiar clam shell, often seen on the beach, there is a living animal.
2. Practice simple anatomy skills: careful observation, delicate manipulation, comparison with a labeled image.
3. Compare the basic anatomies, and functions of organs, between clams and people.

Background Information

The following day, students visit a beach, and find many washed up clam shells. This lesson shows students what was inside every one of those shells: a living animal with parts similar to theirs.

Vocabulary

<u>clam:</u>	a kind of a mollusc, an animal with two flat shells found in sand at the beach
<u>shell:</u>	the hard protective covering around the clam, and other molluscs
<u>mantle:</u>	the part of a mollusc that makes the shell
<u>foot:</u>	the part of a mollusc that lets it move and burrow
<u>gill:</u>	the part of a mollusc that collects oxygen from the water
<u>lung:</u>	the part of a person that collects oxygen from the air
<u>siphon:</u>	the part of a mollusc that sucks that water and food into the shell
<u>filter feeder:</u>	a method of feeding used by clams, where water is filtered by tiny hairs for small food particles

Materials

- science notebook
- clam (e.g. savory clam) for each student. Purchase at a shellfish store e.g. Lobster Man on Granville Island. Store in a fridge in a closed plastic bag for two days before use, so that the animals are dead, but still fresh.
- large petri dish, or other dissecting tray, for each student
- flat toothpick for each student
- tray of water



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- small seeds or grain to represent food particles
- plastic cup to represent the body of the clam
- wire or plastic mesh to represent the hairs inside the clam that trap food

In the Classroom

Introductory Discussion:

a) Link between this and previous lessons if appropriate. e.g. “We have explored two habitats already - the local parks and the forest. This week we will be studying a beach habitat. Today we will look closely at a living thing that we will see at the beach tomorrow.”

b) Hand each student a clam. Questions to discuss:

- Close your eyes, and describe what you feel.
- Is a plant or an animal? Do you know what animal it is? Where have you seen one before?
- Point out that this clam is not alive.
- You are an animal. Does it look like you? In what ways is it different? (This clam is a mollusc, an animal with a shell. You are a mammal).
- What does the shell do? Discuss how the shell protects the clam from predators.

Brief description of science activities to follow discussion:

- Comparison of different sizes of shells and discussion of shell growth.
- Dissection of a clam, identification of major body parts, and comparison of clam and human anatomies
- Model of filter feeding.

Processes of science that the students will focus on: careful observation, comparison, curiosity.

Safety guidelines: students that are allergic to shellfish should abstain from the experiment, or wash their hands very carefully after performing the dissection (gloves are advised).

Science Activities

(1) Activity Title: Looking at the outside of the clam

Purpose of Activity: To see how a shelled animal grows.

Methods and Instructions:

Set-up prior to experiment: a few clam shells of differing sizes, but of the same type as the clam being dissected in the next activity.

Students work individually.

1. Ask students to compare their clam to the shells on their desks.
2. Discussion covering these points:
 - Which is the oldest shell and which is the youngest? How do you know?
 - Shells get larger as the animal inside them grows. The shell grows to fit the body.
 - Where is the new shell added? (on the outer edge - notice that this edge is soft).



(2) Activity Title: Looking at the inside of the clam

Purpose of Activity: To identify the parts of a clam, and compare with human anatomy.

Methods and Instructions:

Set-up prior to experiment: A dissecting tray and toothpick on each student's desk. A labeled image of a dissected clam for each table group (see Clam dissection image). The worksheet glued into each student's notebook.

Students work individually.

1. Ask students if they think the inside of a clam will look the same as us. (We are both animals, but they are a mollusc and we are a mammal, so we might expect that some parts are the same and some are different).
2. Tell students that to look inside we need to get the shell open. The clam has a muscle that keeps the shell tightly closed. As the clams are now dead, the muscle may not be as strong, and we may be able to pull it open. Ask students to try and pull their shell open, while holding the clam over their dissecting dish (water may spill out of the clam). The scientist and/or teacher can open shells that are tightly closed by cutting the two adductor muscles with a sharp knife.
3. Ask students to look at the labeled image of the clam on their desks (ref 1) and to compare it with their own clam, while they wait for everyone's clam to be opened.
4. As a class, go through the worksheet, finding each organ listed in capital letters. As each organ is read out, students are assisted in finding the real organ in their dissected clam, then draw a line from the name of the organ to the relevant part in the clam drawing. The function of the part is discussed. In addition, students draw a line from the human organ names to the relevant part in the human drawing, and discuss the equivalent function in humans.
 - The clam shell protects the clam. It is its shelter. We do not carry our shelter with us.
 - The mantle makes the shell. We do not have a mantle, as we do not have a shell.
 - The clam foot helps the clam dig into the sand. We move with our feet too.
 - The clam gills take oxygen from the water (like fish). We have lungs for taking in oxygen. (Students may need a toothpick to gently lift up the gills to see them properly).
 - One of the clam siphons sucks in water. Tiny food particles in the water get stuck in tiny hairs on the gills. Then the food gets washed towards the clams mouth inside the body. The water goes back out the other siphon. We eat with our mouth. (Students may need to straighten out the siphons with a toothpick to see them properly.)

(3) Activity Title: Filter feeding demonstration

Purpose of Activity: To understand better how a clam feeds

Methods and Instructions:

Set-up prior to experiment: a tray of water, a tub of seeds, a plastic cup stuffed with wire mesh

Students watch a demonstration. One student can assist in the demonstration. Multiple versions of this activity can be set up so that students can each try it.

1. Teacher or student helper adds seeds/grain to a large tray of water, to represent food particles floating in the seawater.
2. The teacher shows the class the mesh stuffed into the cup, representing the hairs inside the clams body.
3. The teacher/student helper scoops the cup through the water and food particles, representing the clam taking in water with a siphon.
4. The teacher/student helper pours the water out of the cup again, representing the water leaving the clam's body by the siphon.



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5. The teacher shows the students the seeds/grain stuck in the mesh, representing the food particles stuck in the hairs in the clam's body.

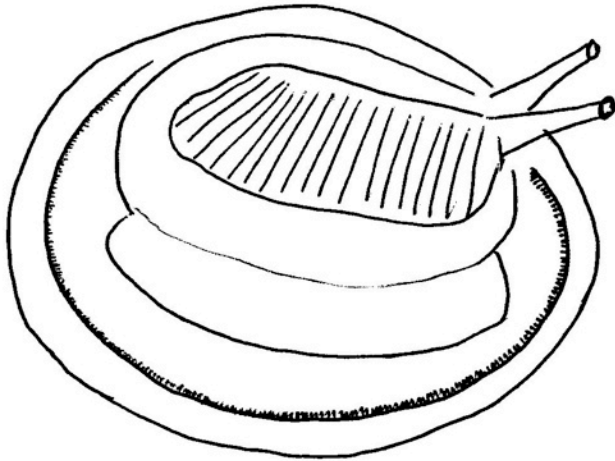
Closure Discussion

We will see clam shells and may be live clams on our beach field trip tomorrow. Now we know that a living animal is or was living in these shells. Like us, they have body parts that help them feed, breathe and move.

References

1. <http://iweb.tntech.edu/mcaprio/whole_no_mantle_L.jpg> Clam anatomy image used by students. Other clam anatomy images for teacher use at <http://iweb.tntech.edu/mcaprio/clam.htm>. Web site hosted by Tennessee Technological University. Accessed May 17, 2010.
2. <<http://nathistoc.bio.uci.edu/Filter%20feeders.htm>> Information on filter feeders, including clams. Website hosted by University of California at Irvine. Accessed May 17, 2010.

Clam



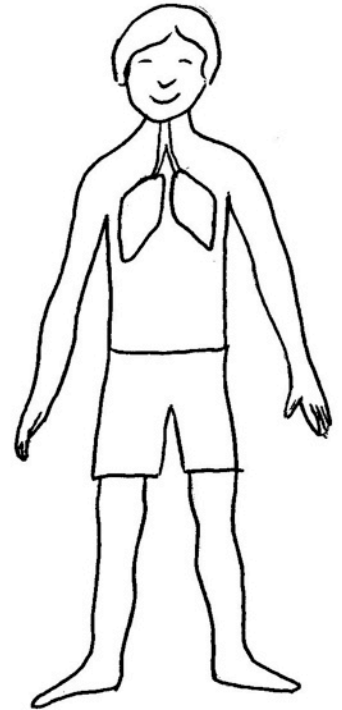
We both eat, using a
SIPHON MOUTH

We both breathe, using
GILLS LUNGS

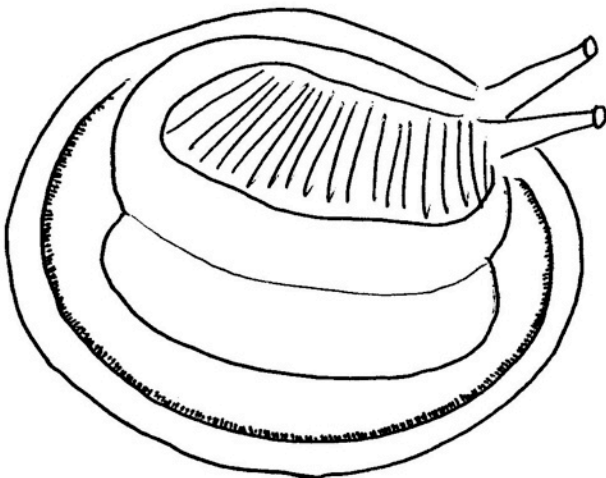
We both move, using our
FOOT

A clam has a
SHELL made by the
MANTLE

Person



Clam



We both eat, using a
SIPHON MOUTH

We both breathe, using
GILLS LUNGS

We both move, using our
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