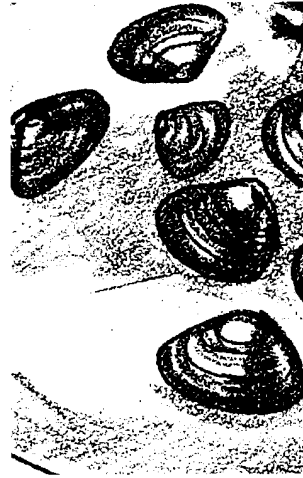


Introduced Species: The Asian Clam in San Francisco Bay

Lesson by Linda Hagelin – Saratoga, CA

Key Concepts

1. Clams are bivalve molluscs that live in muddy or sandy substrate.
2. Clams take in water through siphons to trap plankton and detritus particles for food.



Background

Clams are found worldwide in both fresh and saltwater environments. They live in sandy or muddy substrates and extend siphons to the surface to feed. They are mobile, using a muscular “foot” to dig through the sediment to bury themselves. Clams that live near the surface, such as cockles, have a strong digging foot and short siphons. Those that live deep in the sand and mud, such as the geoduck, have very long siphons to reach the surface, and a relatively weak digging foot. These deep dwellers are rarely uncovered by wave action or predators, and don’t need to dig quickly to escape.

Materials

For each pair of students:

- 1 clam from the fish market (microwave fresh clam 30 seconds or until it just pops open)
- paper towels and newspaper to cover surfaces
- a pair of small pointed scissors or dissecting kit
- a small centimeter ruler to measure the shell width
- “Clam Anatomy” activity page

Teaching Hints

“The Asian Clam in San Francisco Bay” is a 2-part activity which introduces students to the impact of exotic species on an ecosystem. In Part I students become familiar with clam anatomy. They use this information in Part II to infer possible effects of the invasion of an exotic clam that has recently populated San Francisco Bay.

Buy fresh (tightly closed) clams from the fish market. While not ideal, it is possible to have three students working on one clam if your budget is tight. Be sure to microwave the clams, one at a time, JUST until the clam pops open. If “nuked” too long, the clams are cooked and the parts are harder to identify.

It is helpful to project an overhead transparency of the clam diagram and point out body parts to the students before beginning this activity. The students will be identifying major parts of the clam, not internal organs.

The *Marine Biology Coloring Book* by Thomas M. Niesen is a useful resource for this activity.

Key Words

adductor muscles - a pair of thick muscles which hold the clam’s shells shut

bivalve - two shells

detritus - decaying plant and animal material and the bacteria which are breaking it down, often forms a scum on mudflats, estuaries and ocean bottom

foot - the muscular digging organ of a clam

gills - clam gills are covered with hairlike structures and mucus to trap food particles from the water pumped into the shell by the siphons. They also extract oxygen from the water much as a fish gill does.

hinge - leathery structure that connects the 2 shells and functions in opening and closing

hinge teeth - structures near the hinge of the clam shell that interlock and prevent sideways movement of the two shells when they are closed

mantle - the lining of a clam shell that secretes new shell as the clam grows

mollusc - a member of the phylum Mollusca, which includes clams, snails, octopus, squid, chitons

pallial line - a scar on the inside of the clam shell that indicates where the mantle was attached to the shell

plankton - single celled microscopic plants and animals that form the base of the aquatic food chain

siphon - in clams, a dual tube-like organ which is the clam’s lifeline to the surface; water is taken in through one tube and wastes expelled out the other.

substrate - the surface on which a plant or animal grows or is attached

umbo - the “point” of the shell where it began growing

Extensions

1. Once your students are familiar with clams, you might like to investigate other molluscs, such as oysters, mussels. Compare the structures and lifestyles of these bivalves to that of the clam.
2. Make clam chowder at the end of the activity!

Answer Key

5.-7. Answers depend upon experimental results.