

Zoology
Mollusks – Block 1
Nabinger

Purpose

This lesson is intended to introduce the phylum Mollusca and to go over its general physical characteristics. It will also be used to setup a comparison between the major classes (Gastropoda, Bivalvia, Cephalopoda, and Polyplacophora) and to introduce discussion about the role of the mollusks in the ecosystem.

Standards

- Standard 1: Key Idea 1: Perf.Ind. 1, 2
- Standard 1: Key Idea 3: Perf.Ind. 1, 4
- Standard 4: Phys Setting Key Idea 3: Perf.Ind. 1
- Standard 4: Living Envir Key Idea 1: Perf.Ind. 1
- Standard 4: Living Envir Key Idea 5: Perf.Ind. 1
- Standard 4: Living Envir Key Idea 6: Perf.Ind. 1

Time

- 1 Block – 70 minutes
- (Go to Price Chopper and get squid day before)
- (Get shells from bio; get zebra mussels, snails from Oneida, oysters, clams from Wegmans?)

Materials

- Mollusk shells and squid/octopi, living zebra mussels, snails, oysters and any other mollusks available (cleaned shells and untouched shells)
- Mollusk Representative Organisms Observation sheet
- Mollusk Notes Section 1
- Mollusk Class Comparison Sheet
- Mollusk Homework Text Assignment

Activities

| Actions | Time |
|--|-------------|
| Introduce New Phylum (Mollusca) | 5 minutes |
| Do representative sample observation sheet, with general discussion about what was found | 40 minutes |
| Mollusk Notes part 1 | 15 minutes |
| Hand out Mollusk Class Comparison Sheet (web) and Mollusk Homework text assignment | 10 Minutes |

Notes/Improvements

Teacher Notes

1. When introducing the phyla, get pictures of two of the most disparate looking members of the phyla to start discussion. I like clams and squid/octopi because the students are familiar with them.
2. Try to get as many samples as possible. Even samples that are preserved or encased in resin are better than nothing.
3. Try to get as many fresh samples as possible. Grocery stores, fish markets, local lakes, ponds, or the ocean if you are close enough, are all great sources of samples.
4. Get doubles of as many samples as you can so the students can handle one of them.
5. With animals with a shell, get multiple samples and take a couple, freeze them, take the animal out, and soak the shell in bleach for 3-4 hours. Then rinse it liberally with water. Use the cleaned shells as part of the “touch me” sample.
6. Get any charts, pictures, graphs that you can to put next to the samples. Include graphs of population growth, pictures through microscopes, charts of shell sizes, maps of habitats, whatever helps to give the students a more complete picture of the animals.
7. Get gloves for your squeamish students.
8. Be prepared for a fishy smell for a few days!

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Phylum Mollusca Sample Observations

Around the room you will find the representative samples (all the ones I could collect anyway) of the newest phyla, Mollusca. Walk around the room and look at the samples of the phyla, **noting the various physical similarities and differences**. Also **take note of anything that seems to be unique about a particular sample**. At some of the stations there are two samples, one labeled “Go ahead and touch this one!” Feel free to pick that sample up and examine it closely. **Make an educated guess as to what the shells are made of**. There may also be papers, pictures, or graphs accompanying some of the samples (especially the zebra mussels) that you should be sure to examine and understand. When you have examined all of the samples and written down your observations, return to your seat so we can talk about them.

| Sample | Observations |
|--------------------|---------------------|
| 1. Clam | |
| 2. Oyster | |
| 3. Zebra Mussel | |
| 4. Snail | |

| | |
|-----------------------|--|
| 5. Chambered Nautilus | |
| 6. Squid | |
| 7. Octopus | |
| 8. Chiton | |
| 9. Conch | |
| 10. Sea slug | |

Topic 10 – Mollusks

I. Mollusks

A. General characteristics

1. Phylum contains the largest invertebrate, *Architeuthis dux*, or the Giant squid. It can measure up to 18m long.
2. Body consists of three main regions: head-foot, mantle, and visceral mass.
3. Has a mantle that secretes a calcareous shell, covering the visceral mass.
4. Has a mantle that secretes a calcareous shell, covering the visceral mass.
5. Has bilateral symmetry.
6. Mantle cavity functions in excretion, gas exchange, waste elimination, reproduction.
7. Triploblastic
8. Coelom reduced to cavities surrounding heart (pericardium), nephridia, and gonads.
9. Open circulatory system in all but one class (*Cephalopoda*)
10. A radula is usually present and used to scrape food.

B. Body parts

1. The head-foot
 - a. Elongate with anterior head containing the mouth and certain sensory structures.
 - b. Elongate with foot used for attachment and locomotion.
2. The visceral mass
 - a. Contains digestive, circulatory, reproductive, and excretory organs.
 - b. Positioned dorsal to the head-foot.
3. The mantle
 - a. Usually attaches to visceral mass.
 - b. Enfolds the body.
 - c. May secrete a shell (CaCO_3)
4. The mantle cavity
 - a. A space between the mantle and foot.
 - b. Opens to the outside environment.
 - c. Functions in gas exchange, excretion, release of reproductive products.
5. The radula
 - a. Located in the mouth
 - b. Made up of a chitinous belt and rows of posteriorly curved teeth.
 - c. Overlies a cartilaginous odontophore.
 - d. Used to scrape food from a substrate and pass it to the digestive tract.

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Look on the web and find the answers you need to fill in the chart below.

Phylum Mollusca: A Comparison of Major Taxonomic Classes

| Class Name | Class Common Name | Type of shell | Function of the Foot | Presence of well-developed head end (Y/N) | Gills present or absent | Habitat |
|----------------|-------------------|---------------|----------------------|---|-------------------------|---------|
| Polyplacophora | | | | | | |
| Gastropoda | | | | | | |
| Bivalvia | | | | | | |
| Cephalopoda | | | | | | |

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Text Assignment – Mollusks

Read: *Animal Diversity* pp. 177-181, pp. 184-197.

Do: Questions 3, 5, 7, 8, 10, 12, 14 on pg. 201 in *Animal Diversity*.

****Put all of your answers on separate, lined, loose-leaf paper. Staple that page to the back of this one. Make sure your name is on both.****