

# Activity #1 - Phyto- v. Zoo- Plankton

## Objective:

Students will be able to identify two broad groups of plankton: phytoplankton and zooplankton. They will describe the general body adaptations which characterize each group.

## Materials:

- Phyto- and Zoo- student activity sheets
- scissors
- glue
- colored pencils (or felt pens, crayons, etc)

## Student Procedures:

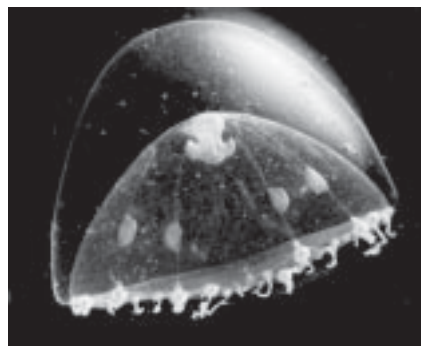
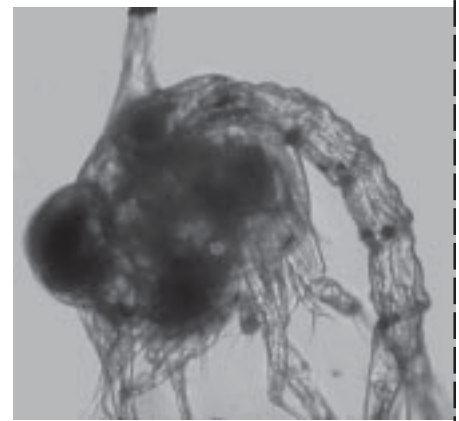
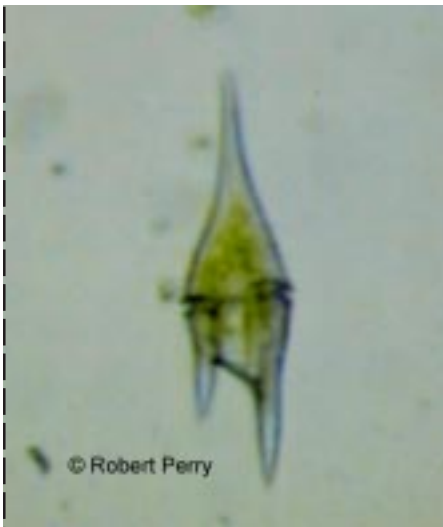
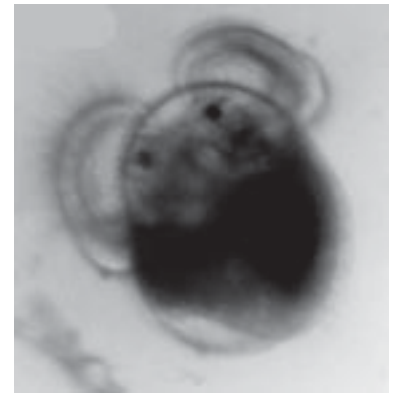
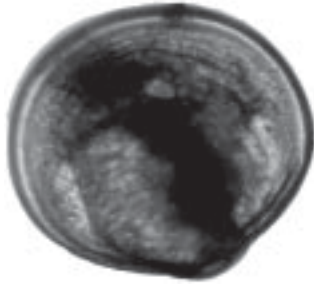
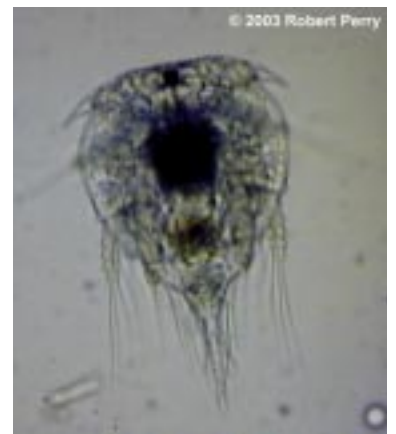
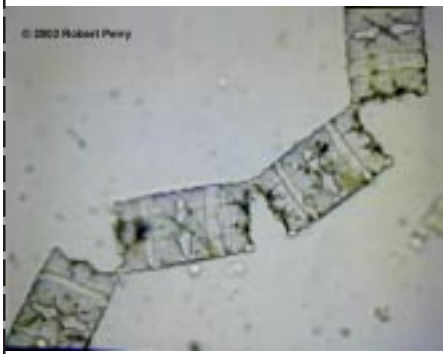
1. Arrange students into small teams. Have them cut out the plankton pictures on their student activity sheets.
2. Next ask each team to sort their pictures into two groups: producers and consumers.
3. Have volunteers share their sorted groupings and tell why they were sorted.
4. Ask students to share and to list the physical characteristics for each of their two groups.

## Evaluation:

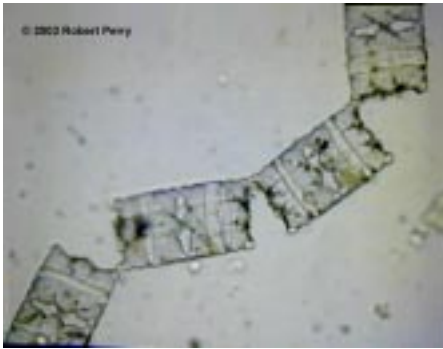
1. Ask the class to find a diatom among their cut out pictures. Tell them that this tiny producer is shaped like a Petri dish: a top half and a bottom half that fit together. The shell of a diatom is made of silicon, the same material as glass. Point out that diatoms use photosynthesis, and together with other kinds of phytoplankton are the producer organisms in the sea. Glass shells do not dissolve easily in salt water so when diatoms die their tiny glass shells sink to the bottom of the deep ocean and pile up. Ask students to color the diatom pictures green.
2. Ask the class to find a dinoflagellate among their cut out pictures.. Tell them that dinoflagellates are also tiny producers, and these plants move by whipping their tail-like projections (flagella). The shell of a dinoflagellate is made of cellulose, like thick cardboard or wood. Point out that dinoflagellates also use photosynthesis, and together with diatoms and other kinds of phytoplankton are the producer organisms in the sea. Dinoflagellates are reddish-brown in color so when they “bloom” this is called a red tide. Dinoflagellates are also bioluminescent and many are toxic. Ask students to color the dinoflagellate pictures red.
3. Ask the class to find a copepod among their cut out pictures. Tell them that copepods are tiny animals related to shrimps, crabs and lobsters. They are the most abundant animal on Earth. Point out that copepods phytoplankton, and are the first level of consumer organisms in the ocean food chain. This is like being a rabbit or a cow in a land-based ecosystem.

4. Ask the class to find the larvae among their cut out pictures. Tell them that larvae are the early developmental stages most animals in the ocean. Point out that larval stages are part of a life cycle that involves a metamorphosis...different appearances at different stages of a life. (As in a caterpillar/butterfly or a tadpole/frog). Ask them if they can think of some animals in the ocean that do NOT have planktonic larval stages. [copepods, krill, mammals, reptiles, birds, and a few groups of fishes].
5. Ask the class to leave the zooplankton uncolored. This is to represent the fact that most zooplankton in the surface waters are naturally clear, without body pigments. Ask for ideas as to WHY zooplankton in the surface waters are transparent. [camouflage in the clear ocean water]. Can students think of any other ocean animals that are transparent or clear? [jellyfish, salps, sea gooseberries, and others]
6. In summary, ask the student teams to discuss and write about the differences between phytoplankton and zooplankton. Suggest that they focus on the differences in appearance and differences in their ecological role.
7. In summary, ask the student teams to discuss and write about what it would be like to be carried around by the ocean currents, unable to swim against them. List and describe some of the advantages of being planktonic as compared with powerfully swimming animals or bottom dwelling life.

# Activity #1 - Student Activity Sheet



# Activity #1 - Teacher Guide Sheet



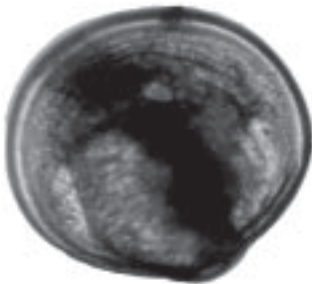
phyto - diatom chain (Biddulphia)



phyto - dinoflagellate (Ceratum)



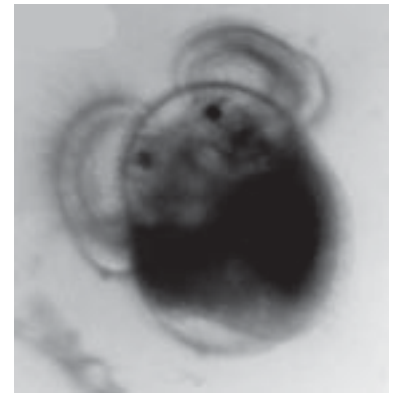
zoo - nauplius larva (barnacle)



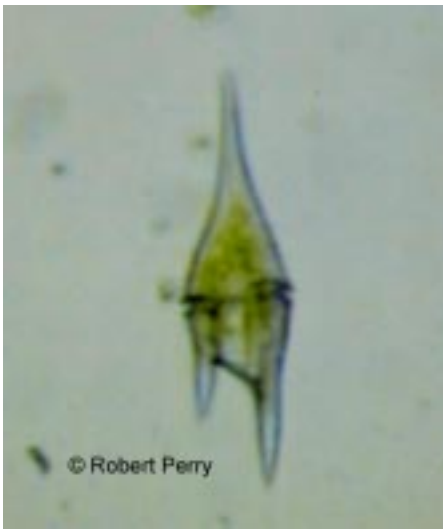
zoo - bivalve veliger larva (clam)



zoo - copepod (Calanus)



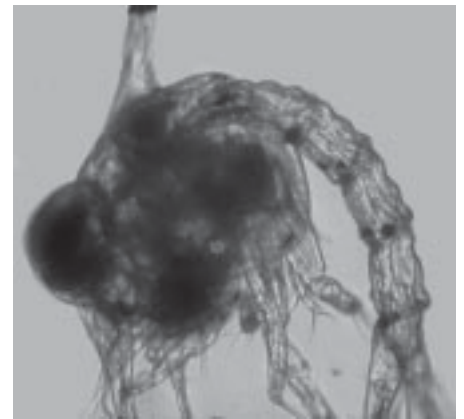
zoo - early veliger larva (snail)



phyto - dinoflagellate (Ceratum)



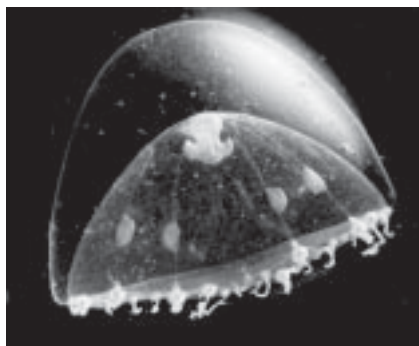
zoo - echinopluteus larva (sand dollar)



zoo - zoea larva (crab)



phyto - diatom (Coscinodiscus)



zoo - medusa (Phialidium)



phyto - diatom chain (Chaetoceros)