WETLANDS: Biofilms and Biodiversity

SOL: Science LS.1, LS.5, LS.8, LS.9

BACKGROUND MATERIAL:
The Elizabeth River provides a habitat for a large number of organisms. The health of the River is important in maintaining the high level of biodiversity – the variety of species located within an ecosystem. Water quality has a direct effect on the biodiversity within the ecosystem. The connection between water quality and biodiversity helps us to understand how abiotic (nonliving) factors affect biotic (living) factors in an aquatic environment. Biofilm cultures help us to study the macroinvertebrate animals living in the water.

Biofilms begin with a slimy layer of bacterial colonies. These bacterial colonies provide an attractive environment for other bacteria and larger invertebrates. Larger organisms such as barnacles, mussels, and worms attach near the bacterial colonies. Zooplankton and phytoplankton also associate with these communities. Biofilm communities can develop on any hard surface.

See website attachment for further information.

Are hard structures a good habitat for aquatic organisms?

MATERIALS:
- Plexiglass Rack or CD Tower (see attached sheets)
- Hand Lenses, Dissecting Microscopes or Web Cam
- Large petri dishes (to fit biofilm disks)
- Maryland Sea Grant Website http://www.mdsg.umd.edu/Education/biofilm/index.htm

ACTIVITY: “Biofilms and Biodiversity”
Teacher Notes: Students will make observations of biofilm disks. They will use the Maryland Sea Grant website to identify the organisms
1. Place the disk from the rack or tower in a petri dish of Elizabeth River water.
2. Use a hand lens, microscope, or web cam to observe the microinvertebrates.
3. Use Maryland Sea Grant web pages to identify organisms and classify the organisms in kingdom, phylum, and class.

Comprehension questions:
1. What organisms are in the Elizabeth River water?
2. What kingdoms, phyla, and classes do these organisms belong to?
3. What relationship do these organisms have to the water quality in the River? (oxygen, pollution, temperature)
4. How does the depth of water affect the types of organisms on the disk?
5. What relationships exist among the organisms?