

The World of Protists

Purpose:

This lesson will give students the opportunity to explore protists through an online virtual lab as well as a hay infusion lab. Students will identify common protists, gather general background information on each, and discover that there is much more to the world than meets the eye! Students will discuss the three major groups of protists as well as the importance of these tiny living organisms. Students will also gain experience in observing living organisms and using lab equipment.

VA SOLs:

BIO. 1. The student will plan and conduct investigations which meet the following criteria:

- a. Observations of living things are recorded in the lab and in the field.
- h. Chemicals and equipment are used in a safe manner.

BIO.4. The student will investigate and understand relationships between cell structure and function. Key concepts include the following:

- b. Exploring the diversity and variation of eukaryotes

BIO.5. The student will investigate and understand life functions of archaebacteria, monerans (eubacteria), protists, fungi, plants, and animals (including humans). Key concepts include the following:

- a. How their structures and functions vary between and within the kingdoms
- c. Analyses of their responses to the environment

Materials and Resources:

Laptop computers / Internet

<http://www.microscopy-uk.org.uk/index.html?http://www.microscopy-uk.org.uk/ponddip/index.html> (Virtual Pond Dip)

Activity sheet

PowerPoint

Protist note outline

Jar (mayo or jam, etc)

Hay

Pond or creek water

Petri dishes

Pipette

Antibacterial soap for clean-up

Few grains of yeast

Lab activity sheet

Classroom Management and Safety Issues:

Students should follow the Acceptable Use Policy for using school computers and Internet.

Students need to practice proper lab conduct while working with lab equipment and living organisms. Also, the hay infusion has a very high bacteria count. While most are not harmful to humans, there may be bacteria in the culture that could cause infection on contact. Students need to wash with soap and water if the culture gets on skin or rinse their eyes if any of the culture liquid contacts them. Wash any cuts that make contact with water and then sterilize with hydrogen peroxide or iodine.

Procedures:

Engage (25 minutes)

1. Students will be shown a jar of pond water and asked how much life they think exists in the jar. Students will then watch a “Bill Nye: The Science Guy” video regarding protists.

Explore (45 minutes)

2. Students will participate in an online virtual pond dip where they will begin to familiarize themselves with potential pond water microorganisms. Students will complete an activity sheet that outlines organism name, size, general notes about where to find it or an interesting fact, and a quick sketch. The virtual pond dip can be found at <http://www.microscopy-uk.org.uk/index.html?http://www.microscopy-uk.org.uk/pondip/index.html>.

Explain (15 minutes)

3. Students will explore the basics of protists through PowerPoint slides. This will include going over general characteristics, the four protists groups, and protist importance. Various photos will also be shown. Notes in outline form will be provided.

Elaborate (90 minutes)

4. Students will complete the hay infusion lab, thus observing live organisms (specifically protists). They will also complete a corresponding lab sheet. Preparation for the lab includes collecting a pond/stream water sample into a jar, adding a few drops of skim milk and yeast (as a food source for microorganisms), adding hay, and allowing the solution to incubate at room temperature with partial sunlight exposure for a few days to a week. Additional oxygen will be provided to the solution at least once a day by using a pipette to bubble air into the water.

Evaluate

5. The virtual pond dip activity sheet will be graded based upon how many organisms students identify and record information for (2 points each). Notes will be graded for completion only (5 points). The lab handout will be graded using the following rubric:

Section	# Questions	Points Each	Points Total
Drawings	8	1.5	12
Summary Questions	7	2*	13
Total			

*Question #1 is only worth 1 point.