

# Pond Life



## **Annotation:**

This is a single-subject lecture/hands on demonstration. Its objective is to give the students experience in visual observation of single and multi-cellular organisms which are present in a pond.

## **Primary Learning Outcomes**

Students will understand there is life at various levels of existence and can address questions concerning which types of single and multi-cellular life forms exist in a natural environment, such as a lake or pond.

## **Additional Learning Outcomes**

What role does each micro-organism play with each other for survival, ie: are they food for each other or do they co-exist for the purpose of building communities for protection.

Upon Completion students:

- will have a better understanding of how to use a microscope.
- will learn how to prepare a specimen on a slide.
- will learn about unicellular vs. multicellular life in a pond

## **Assessed QCC Standards:**

*Grade: 9-12*

*Science*

*Biology*

1

Topic: Science Process Skills, and Laboratory Safety

Standard: Uses terms and processes employed in scientific research. 1.1. Demonstrates proficiency in the use of science process skills in laboratory and/or field activities involving observation, classification, communication, metric measurement, prediction, inference, identifying variables, formulating hypotheses, controlling variables, making operational definitions, designing investigations, experimenting, collecting qualitative and/or quantitative data, constructing a data table, graphing, analyzing, and interpreting data and/or drawing conclusions. 1.2. Produces written reports of laboratory and/or field activities in accepted formats and use precise language for presentations of procedure, tables of data, graphs, analytical methods, results, and analyses of error. 1.3. Uses laboratory equipment to conduct safe and accurate laboratory work. 1.4 Demonstrates the proper care and use of the microscope and how to prepare slides.

2

Topic: Research

Standard: Demonstrates appropriate use of reference sources to access, analyze, evaluate, and present information related to research problems. 2.1 Uses media resources such as print, audiovisual, and online services to find information.

4

Topic: Cellular Biology (Structure)

Standard: Explains the cellular basis of life. 4.1 Distinguishes between living and nonliving things (e.g., characteristics of living things). 4.5 Distinguishes between unicellular and multicellular organisms.

15

Topic: Diversity of Life (Kingdom Monera)

Standard: Describes characteristics and examples of monerans. 15.1 Describes the cellular structure and the conditions necessary for growth and reproduction.

20

Topic: Diversity of Life (Kingdom Animalia: Invertebrates)

Standard: Describes the anatomy and physiology of each phyla of invertebrates. 20.1 Explains the classification of organisms within each phyla. 20.2 Identifies major structures and their functions for common organisms in each phylum of invertebrates. 20.3 Describes the life processes of selected organisms in each phylum, i.e., 20.4 Evaluates the economic significance of certain invertebrates.

### **Non-Assessed QCC Standards:**

Grade: 9-12

Science

Biology

26

Topic: Ecology (Biomes)

Standard: Lists and describes the major biomes of the world. 26.1 Locates the major biomes on a world map. 26.2 Compares the biotic and abiotic factors that distinguish the major biomes.

27

Topic: Ecology (Environmental Issues)

Standard: Assesses the impact of man's activities on the environment and explore ways to help solve ecological problems. 27.1 Analyzes the possible causes of certain ecological problems (e.g., acid rain and pollution). 27.2 Identifies possible solutions to current ecological problems.

### **Procedures/Activities**

Step: 1 Duration: 20-30 min (Before Class).

It is much easier to have stations set up before students arrive. This would include having at each station a microscope, cover slip and slide, fresh pond water, eyedropper, safety goggles and gloves if anyone would like to use them, but the gloves are not necessary. Having the station already set up reduces the chance of any accidental damage to the microscope by moving it.

Step: 2 Duration: 5 min

Have the students place their safety goggles on and their gloves (optional) and place a drop of pond water on a slide and place the cover slip on top. It is important that you only use a drop because if too much water is on the slide the faster microbes will not be as easily seen as the slower one. Less water gives them less space to swim in.

Step: 3 Duration: 20-25 min

Observe slide under microscope and identify organisms. To familiarize the students with the microscope, have them adjust the lens powers and focus in and out. Also have them adjusting the light source to get a better understanding of how light effects the image.

Optional.

The following web page show the various micro-organisms found in a pond. You can show this before the students start to give them an idea of what they will see, or after they have looked at their slides for comparison.

<http://micro.magnet.fsu.edu/moviegallery/pondscum.html>

### **Materials and Equipment**

Microscope

Fresh Pond Water

Slides and Cover Slips

Safety goggles and eyedropper.

### **Total Duration**

30 min

### **Assessment**

- Are there unicellular or multicellular organisms in ponds?
- How does light effect the image in the microscope?
- What is the difference between magnification and resolution?

### **Extension**

- Do these organisms differ with regard to pond water in colder climates vs. more ponds in more temperate climates?
- Does animal run off affect these organisms?
- How would you test these questions?