



## Unit I – Basics of Biology

### Chapter 19 Protists - Protozoa

#### Lab # 19 Identifying Protozoa in Pond Water

**Note to Teacher:** While students are engaged in their lab setting, have them listen to the music track to the beginning of VSU Lecture 17, "Monerans, Protists, Plants & Animals"-- VSU Lecture 17. Brain research indicates that when we listen to something different while we are learning something new, neurons will be connected which will help us remember the information more efficiently.

Reference: Gardner, H. (1991). The unschooled mind: How children think and how schools should teach. New York: Basic.

Science Education Program, The University of Iowa N259 Lindquist Center Iowa City, IA 52242

#### Strategy

You will conduct a lab where you will use Professor Paul's Power Point Slides to help you identify certain Protozoa in pond water. Get with your teacher for details. You will create your own lab report to explain how you identified these organisms. You will work in partners.

**Teacher's Note:** In this lab exercise, pair up a left brain child with a right brain. This challenges the class to work in a real world scenario. Before you do this lab, you should set up a small pond in your school yard or in your backyard. Consult your school administration and your parents first to obtain permission. You should undergo this activity in Early Fall or Early Spring. With a Team of three people you should be able to build your pond in six to ten hours.

Follow this link to learn more:

<http://www.thisoldhouse.com/toh/how-to/intro/0,,20205593,00.html> This activity involving pond water should take approximately 50 minutes.

Reference: McCarthy, B. (1987). The 4Mat system: Teaching to learning styles with right/left mode techniques. Barrington IL: EXCEL.

You will conduct the challenge activity at the end of the lab.

#### Materials

Pond Water

Light Compound Microscope

Golden Guide Nature Book (from Carolina Biological Supply)

Blank Slides  
(2) 1 ml Pipettes  
250 ml Beaker  
Lugol's Iodine Solution  
Computer Paper  
Coloring Pencils



Score: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Class/Teacher: \_\_\_\_\_

School: \_\_\_\_\_

### Procedure

- 1.) Print out page two thru twenty one of VSU Lecture 19, "Protists-Protozoa". Use these pages as a reference.
- 2.) Pour 200 ml of pond water into a 250 ml beaker. Make sure the pond water has a high level of turbidity. To understand what turbidity means, I am posting a link to the EPA where you will learn what it means. [http://www.epa.gov/ogwdw/mdbp/pdf/turbidity/chap\\_07.pdf](http://www.epa.gov/ogwdw/mdbp/pdf/turbidity/chap_07.pdf) Paste the following links to your browser: <http://www.thisoldhouse.com/toh/how-to/intro/0,,20205593,00.html> and <http://www.ectorcountyisd.org/17982011810305817/site/default.asp> The first link will help you build your own pond at school or at home. The second link to Ector County ISD is to the Permian High School Botanical Garden.

**Note to Teacher:** Permian students and teachers build two water ponds out in the Permian High School Botanical Garden in the fall of 1988. They are still in existence and the school has received state and national awards for this dynamic outdoor learning center. "Professor" Paul O. Briones Co-Creator of Virtual Science University is also one of the five Permian High School Biology Teachers that helped plan and build this outdoor learning center. For more info, contact him at 1-877-920-5550.

**Hint:** When you have pond water that has high turbidity, you will have huge volumes of micro-organisms in the water. This makes it an ideal sample.

- 3.) Using your 1 ml Pipette, take a sample of the turbid water.
  - 4.) Pour a large drop onto your blank slide.
- Note to Teacher: Monitor student's slides frequently. Try to get them to isolate some Water Daphnia (Water Fleas), Paramecia, and some Moss or Algae. By doing this, you allow them to observe both an animal and a plant. Also have them get some turbid water from down at the bottom. Stick a stirring rod in the turbid water sample. Take the stirring rod out and slowing spread it over several Agar Petri Plates. Place the plates in your incubator for 72 hours. After 72 hours, you should have some bacteria growing in your Petri Agar Plates.
- 5.) Regulate the amount of light in your compound microscope by manipulating the diaphragm. Reduce the amount of light as much as possible. These will keep your live sample alive.
  - 6.) Look into the field and see how many micro-organisms you can identify.
  - 7.) Now, put a small drop of Lugol's Iodine Solution using your other clean pipette.
  - 8.) Watch your slide as the Lugol's Iodine Solution diffuses into your slide specimen. After three minutes, your micro-organisms will go under with the Lugol's Iodine Solution.
  - 9.) Make illustrations of what you see on computer paper. Be very specific and pay attention to

details.

10.) Use your Golden Guide Nature Book from Carolina Biological Supply to identify your micro-organisms. You can find hundreds of biological micro-organisms in pond water but you only need to find five organisms.

11.) Follow up what you did in step nine and try to be as specific as possible.

### Analysis

1.) What is the phylum name of the zooplankton micro-organisms that you have been studying in your pond water? \_\_\_\_\_

2.) Name one of the organisms you have identified. Give its Binomial Nomenclature Name:

\_\_\_\_\_

3.) How does this organism move? Be Specific.

4.) How does this organism feed? Be Specific.

5.) Name a protozoan you have identified. Give it Binomial Nomenclature Name:

\_\_\_\_\_

6.) How does this organism move? Be Specific.

7.) Name any unique identifiable structures found on this organism. How are these structures used?

### Conclusion

1.) You should be able to answer all questions related to pond water project involving Protists.

### Challenge

1.) You should be able to create your own pond at home or on the school yard. Make sure you get permission first from your parents and school administration before you initiate this rewarding experience. If you aspire to someday be a Protistologist, here is your first opportunity to show how much you already know. Be able to discuss your findings from your water pond project in such a way that you show you have internalized the information.