

## Find the Speed of a Protist

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### Summary

This lesson is part of a whole week unit on comparing single celled organisms to multi-celled organisms using a microscope. At the beginning of the week, students become familiar with how to use a microscope. They will learn how to place slides on the tray, use the focus, and magnifications. The next class is spent studying our pond sample that is taken from a Brookline pond near Route 9. In pairs, students begin to look at the samples under the microscope and begin to identify multi-celled organisms and single celled organisms. The students then design their own procedures for finding out the speed of a protist. We spend some time reviewing how to find the speed of objects, so they have some prior knowledge about speed. Later on the entire class creates a Distance vs. Time graph to interpret the average speed of a protist in our pond sample. A final class is spent on discussing the possible errors of the lab, what went well, and there is a tie in to the ecosystem that the sample came from. This leads into a unit on ecosystems, biomes, food webs, and later on environmental issues.

### Objectives

- Students will be able to identify and explain what is a protist
- Students will be able to identify and explain what is a multi-celled organism
- Students will use distance and time to find the speed of a protist
- Students will learn how to use a microscope

### Essential Questions

- How are multi-celled and single celled organisms different in the two watersheds?
- Why is the watershed an integral component of our ecosystem?

### Materials

Brookline pond sample

Beakers

Eye droppers

Microscopes

Slides

Rulers

Stopwatches

Calculators

### Connections to Frameworks

*Learning Standard 2*, Recognize that all organisms are composed of cells and that many are single celled organisms

*Learning Standard 4*, Recognize within a cell, many basic functions of organisms are carried out. The way in which cells function is similar in all living organisms

*Learning Standard 12*, Graph and interpret distance vs. time graphs

### **Connection to Neponset**

Students will be able to see micro and macro organisms that live in the waters that surround their community. They will learn how these organisms live and coexist in a local habitat. Students will learn about how the watershed is important to the life of the ecosystem that they live in. Students will compare a pond sample from the Charles River Watershed to that of the Neponset Watershed. The students will redo the laboratory with the Neponset sample and then make correlations among the two watershed samples.

### **Procedures**

- In pairs, students fill a 100 mL beaker of the pond sample
- Place 2-3 drops of the pond sample on a slide
- Using a microscope identify a protist
- Pairs then design a method for calculating the speed of a protist
- Students then will fill out the worksheet to be handed in

### **Assessment**

The teacher walks around the class and makes sure that all students are engaged and on task. Students need to get approval from the teacher that what they are observing is a protist before developing method to calculate its speed. The teacher is always walking around and asking the class if they find anything that looks interesting to call us over so we can look too. Students must complete the worksheet that asks for their design project, methodology, and calculations. The student's grade is based on teacher observation of student participation and completion of the worksheet.

### **Accommodations**

The special education aide is allowed to work along side a student that requires directions and procedures to be read aloud. The student is given extra time at lunch, recess, or after school to complete the activity if the pace of the lesson is too fast.

### **Resources**

Fred St. Ours' Website <http://efg.cs.umb.edu/streams/>

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

What was the problem you were trying to solve?

How did you find the distance?

What was the distance traveled? \_\_\_\_\_

How did you find the time?

What was the time? \_\_\_\_\_

How did you find the speed?

What was the speed? \_\_\_\_\_