



Share with Your Students

Microorganisms Are Tiny

1. Make copies of Student Resource 1.1, *Vocabulary*, and distribute to students. Discuss the definitions with students as the terms come up throughout the section.
2. Write the word *microorganism* on the board. Ask: **What are the two parts of the word? What does each part mean?** (*"Micro"* means *tiny*; *"organism"* means a *living thing*. A *microorganism* is a *tiny living thing that cannot be seen without a microscope*.)
3. Show students a drop of amoeba culture from a dropper. Tell them that hundreds of organisms live in this drop. The organisms in the drop are much smaller than a millimeter (mm) and are measured in micrometers (μm). Have students hold their thumb and index finger close together so they can barely see light between them. Tell them that this space is approximately 1 mm. If you could divide 1 mm with 1,000 lines, the lines would be 1 μm apart.

Name _____ Date _____

Vocabulary STUDENT RESOURCE 1.1
INFORMATION SHEET

algae protists that resemble plants
Algae contain chlorophyll, a green substance that is important in photosynthesis. Algae are producers. Euglenas and volvox are algae. The singular of *algae* is *alga*.

micrometer (μm) tiny unit of measurement for length;
1,000 μm = 1 mm
Most microorganisms are measured in micrometers.

microorganism an organism that cannot be seen without the aid of a microscope
The amoeba, paramecium, and hydra are microorganisms.

protist a small organism, usually made of one cell, that has some of the characteristics of a plant or an animal
A euglena is a plant-like protist. An amoeba is an animal-like protist.

protozoan a protist that resembles an animal
A paramecium, stentor, spirostomum, and amoeba are protozoans. Protozoans are consumers and must eat food.

CLASSIFICATION • SECTION 1 MICROORGANISMS • 11

Copyright © Houghton Mifflin Company. All Rights Reserved.

Student Resource 1.1 (p. 11)

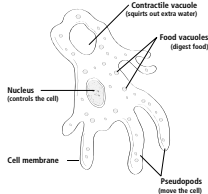
Investigate 1

Observing Microorganisms

Name _____ Date _____

Amoeba STUDENT RESOURCE 1.2
ACTIVITY SHEET

An amoeba is a one-celled protozoan. Look for tiny gray "blobs" on the slide. When you see an amoeba, look for the structures shown in the diagram.



Movement An amoeba moves with pseudopods ("false feet"). It extends a "foot" of cytoplasm in one direction, and the rest of the body flows into that area.

Feeding An amoeba surrounds another live organism with its pseudopods and takes it into a food vacuole.

Reproduction When an amoeba gets too large, it divides in half. The nucleus splits, too.

Size 600 μm (Two amoebas would almost fit in 1 mm.)

Answer the following questions.

1 Is the amoeba alive? How do you know?
Yes. It eats, grows, moves, and reproduces.

2 How is an amoeba like an animal?
It eats other organisms.

CLASSIFICATION • SECTION 1 MICROORGANISMS

Copyright © Houghton Mifflin Company. All Rights Reserved.

Student Resource 1.2 (p. 12)


80 minutes (This activity can be spread over several days by setting up a few organisms each day.) **Pairs**

Objectives

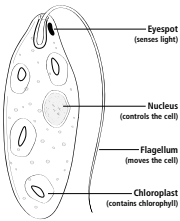
- Students use microscopes to observe microorganisms.
- Students compare structures, kind of food, and reproduction of microorganisms.
- Students classify microorganisms based on their structures and their method of movement.

Observing Microorganisms (continued)

Name _____ Date _____

Euglena STUDENT RESOURCE 1.3
ACTIVITY SHEET 

Euglenas are one-celled algae. Look for tiny green organisms moving on the slide. When you see a euglena, look for the structures shown in the diagram.



Movement A euglena moves by whipping its flagellum around like a helicopter propeller.

Feeding A euglena has chloroplasts that contain chlorophyll. When light is available, the euglena makes its own food the way a plant does. When there is not enough light for photosynthesis, the euglena acts like an animal and captures food.

Reproduction When a euglena gets too large, it divides in half. The nucleus splits, too.

Size 35 μm

Answer the following questions.


1 How many euglenas would fit end to end in 1 mm?
28

2 How does a euglena find light?
It detects light with its eyespot.

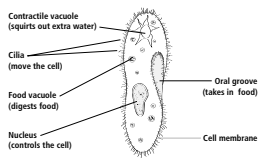
CLASSIFICATION • SECTION 1 MICROORGANISMS • 13

Student Resource 1.3 (p. 13)

Name _____ Date _____

Paramecium STUDENT RESOURCE 1.4
ACTIVITY SHEET 

A paramecium is a one-celled protozoan. Look for organisms that are shaped like the sole of a shoe. When you see a paramecium, look for the structures shown in the diagram.



Movement A paramecium moves like a bumper car. The cell is covered with cilia. The cilia beat back and forth to move the cell. Switch the microscope to high power to see the cilia moving.

Feeding A paramecium feeds on bacteria and other tiny organisms. Cilia push the food into an opening called the oral groove.

Reproduction When a paramecium gets too large, it divides in half. The nucleus splits, too.

Size 180 to 300 μm (Three to five paramecia would fit in 1 mm.)

Answer the following questions.

1 Water enters the paramecium with its food. Which structure lets the paramecium get rid of extra water?
the contractile vacuole

2 What might happen to the paramecium if it didn't have that structure?
It might fill up with water and burst.

14 • CLASSIFICATION • SECTION 1 MICROORGANISMS

Student Resource 1.4 (p. 14)

Materials

For each viewing station

1 *depression slide with live microorganism

1 *microscope

For the class

- Live microorganisms in labeled jars

- slowing agent

*Not provided in kit

Student Resources

- 1.2 *Amoeba*

- 1.3 *Euglena*

- 1.4 *Paramecium*

- 1.5 *Stentor*

- 1.6 *Spirostomum*

- 1.7 *Volvox*

- 1.8 *Hydra*

- 1.9 *Vinegar Eels*

Inquiry Focus

- Classify

In Advance

- Set up 16 viewing stations around the room, with one microscope and one prepared depression slide at each station (two stations for each of the eight microorganisms included in the kit). Set up stations for the same microorganisms side by side so they can share the culture jars. Prepare the slides as described in *Preparing Depression Slides of Microorganisms*, page T8. Focus each microscope, using low power for all organisms except *Euglena*, which requires high power. Next to each microscope, tape the corresponding Student Resource so students will know what they will view at that station.
- As an alternative to multiple viewing stations, use a video/microscope projection system to show each microorganism to the entire class at the same time.

1. Distribute the Resource pages.

Make copies of Student Resources 1.2 through 1.9 and distribute to students.

2. Prepare the class for viewing microorganisms.

Show the jars of organisms and explain that each jar is a tiny pond with only one type of microorganism. Read the labels on the jars and describe the organisms. Three organisms are large enough to see in the jar: hydra look like 2mm strings attached to the sides and bottom of the jar, vinegar eel and spirostoman look like lines moving in their jars. The volvox and euglena jars look green as these organisms carry on photosynthesis. In the other jars the organisms are too tiny to see but each jar may contain thousands of live microorganisms.