

Prentice Hall Science Explorer: Cells and Heredity

Lesson Plan: Looking Inside Cells, Cell wall and Cell Membrane

Adapted from Prentice Hall Science Explorer: Cells and Heredity by Michael Thomas

Chapter 1 Section 2 Day 1

50 minutes

### **Introduction Activity:**

- 1.) Look at the organism in the photo. The organism is an amoeba, a large single-celled organism. This type of amoeba is about 1 mm long.
- 2.) Multiply your height in meters by 1,000 to get your height in millimeters. How many amoebas would you have to stack end-to-end to equal your height?
- 3.) Many of the cells in your body are about 0.01 mm long- one hundredth the size of an amoeba. How many body cells would you have to stack end-to-end to equal your height?

### **Student Reading Material**

*Read together, alone, in groups, or a combination of these. This reading is found in the student edition on pages 16-17. As you read this material, take notes in chunks. For example, take notes on each of the following sections: Looking Inside Cells, Cell Wall, and Cell Membrane. Try to find one or two key sentences or phrases for each section.*

### **Looking Inside Cells**

*Nasturtiums brighten up many gardens with green leaves and colorful flowers. How do nasturtiums carry out all the functions necessary to stay alive? To answer this question, you are about to take an imaginary journey. You will travel inside a nasturtium leaf, visiting its tiny cells. You will observe some of the structures found in plant cells. You will also learn some of the difference between plant and animal cells.*

*You will discover on your journey, there are even smaller structures inside a cell. These tiny cell structures, called **organelles**, carry out specific functions within the cell. Just as your stomach, lungs, and heart all have a different function within the cell. Now it's time to hop onboard your imaginary ship and sail into a typical plant cell.*

### **Enter the Cell**

*Your ship doesn't have an easy time getting inside the cell. It has to pass through the cell wall and the cell membrane.*

### **Cell Wall**

*As you travel through the plant cell, refer to figure 12. First, you must slip through the cell wall. The **cell wall** is a rigid layer of nonliving material that surrounds the cells of plants and some other organisms. The cells of animals, in contrast, do not have cell walls. **A plant's cell***

**wall helps to protect and support the cell.** The cell wall is mostly made of a strong material called cellulose. Although the cell wall is tough, many materials, including water and oxygen, can pass through easily.

### **Cell Membrane**

After you sail through the cell wall, the next barrier you must cross is the **cell membrane**. All cells have cell membranes. In cells with cell walls, the cell membrane is located just inside the cell wall. In other cells, the cell membrane forms the outside boundary that separates the cell from its environment.

#### **The cell membrane controls what substances come into and out of a cell.**

Everything the cell needs, from food and oxygen, enters the cell through the cell membrane. Fortunately, your ship can slip through, too. Harmful waste products leave the cell through the cell membrane. For a cell to survive, the cell membrane must allow these materials to pass in and out. In addition, the cell membrane prevents harmful materials from entering the cell. In a sense, the cell membrane is like a window screen. The screen allows air to enter and leave a room.

*Think it Over*

*Look at a metric ruler to see how small 1 mm is. Now imagine a distance one one-hundredth as long, or 0.01 mm. Why can't you see your bodies cells without the aid of a microscope?*

### **Key Concepts:**

What role do the cell wall and the cell membrane play in the cell?

What are the functions of cell organelles?

### **Key Terms**

Organelle

Cell wall

Cell membrane

### **Objectives:**

**After this lesson, students will be able to:**

**C.1.2.1 Identify the role of the cell wall and cell membrane in the cell**

### **Focus:**

Point out that when Hooke observed cork cells, what he saw was the cell wall.

**Teach:**

Have students locate the cell wall in figure 8.

Ask: What is the function of the cell wall? (*It helps protect and support the cell.*)

Have students locate the cell membrane in figure 8.

Ask: What is the function of the cell membrane? (It controls what substances come into and out of a cell.)

Ask: Which two structures do plants have? (Both)

Ask: What about animal cells? (Only cell membranes, not cell walls)

**Apply:**

Point out that cells with cell walls also have a cell membrane.

Ask: Why does a cell with a cell wall have a membrane?

(The cell wall separates the cell from the outside environment, but it cannot control all substances that come into and out of the cell.)

**Check for Understanding or Guided Practice**

**Give students the following checkpoint. Walk about the room to make sure students are on the right track. If one or more of the following questions is giving many students trouble, feel free to stop and revisit the necessary material.**

Thinking back to your reading, use text evidence to answer the following questions or prompts:

- 1.) Write a short summary of what the cell wall is responsible for. Please use your own words.
- 2.) Complete the following analogy:  
Cell Wall: Fence/Gate  
Cell Membrane: (Window screen, bouncer, anything that allows something in.)
- 3.) Sketch an example of a cell wall. Put adjectives and nouns around the cell wall that represent the function that it serves. (Examples: strong, defined, structure, tough, etc.)
- 4.) Sketch an example of a cell membrane. Put adjectives and nouns around the cell membrane that represent the function that it serves. (Examples: permeable, enclosing, all-around, etc.)