

The Nature of Cells: The Cell Theory

Scientists have been studying living things for over 400 years. At first, they made observations with their unaided eyes. Later, the development of the microscope allowed scientists to see cells for the first time. After observing many different living things under the microscope, scientists realized that all living things are made up of cells. This conclusion led scientists to develop the **cell theory**—an explanation that summarizes the basic characteristics of living things.

The cell theory states the following:

- All living things are composed of one or more cells.
- The cell is the basic unit of life.
- All cells come from pre-existing cells.

The cell theory is true for all living things, regardless of size or complexity. Since cells are common to all living things, studying cells can help us understand how living things work. Different living things carry out the characteristics of life in different ways. Plants, for example, respond to their environment differently than animals do. Figures 1 to 3 show cells from different living things. Studying cells has improved our knowledge of how different living things meet their needs. You will learn more about this in Chapter 6.

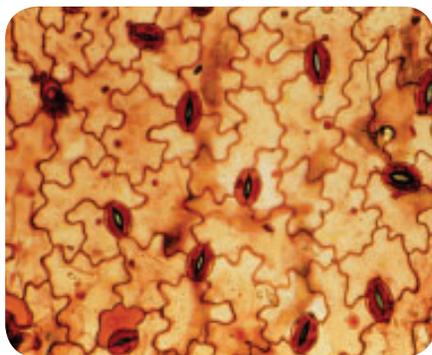


Figure 1 Two types of plant cells: the dark kidney bean-shaped cells are used for gas exchange and the puzzle piece-shaped cells are epithelial cells.

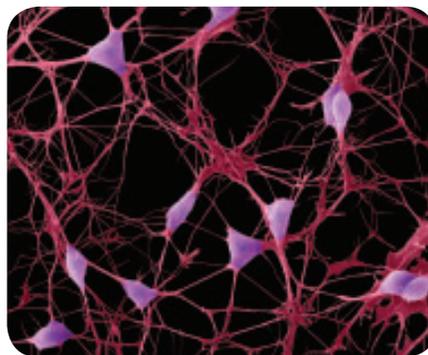


Figure 2 Nerve cells allow animals, including humans, to respond to changes in their environment.



Figure 3 Smooth muscle cells line the organs of the digestive system and help move food through the digestive tract.

cell theory: the theory that states that all living things consist of cells, that the cell is the basic structural and functional unit of life, and that all cells come from pre-existing cells

LINKING TO LITERACY

Summarizing the Main Idea

Summarizing is identifying the most important points in the text. As you read, look for the important details by asking yourself, “What are the basic principles or ideas of cell theory?”

Unit Task The cell theory summarizes the basic characteristics of living things. How will you apply this theory to the Unit Task?

CHECK YOUR LEARNING

1. What does the cell theory state?
2. Explain how scientists developed the cell theory.
3. In this section, you saw photos of four different types of cells. Why do we study cells from different living things?