

Cell Theory Trail

Trace how observations became a scientific explanation.

6.13.A “describe the historical development of cell theory and explain how organisms are composed of one or more cells, which come from pre-existing cells and are the basic unit of structure and function;”

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline each scientist's name and what that scientist observed or concluded. Circle the three linked claims of cell theory so you can see how the evidence led to the theory.

From Cork to Cell Theory

- ① In 1665, English scientist Robert Hooke looked at a thin slice of cork through a microscope. He saw many tiny boxlike spaces and named them cells because they reminded him of small rooms. Cork cells were dead, so Hooke did not see their living parts. Soon afterward, Antonie van Leeuwenhoek used stronger lenses to view living cells in pond water, blood, and other samples. Their observations showed that tiny structures could be studied, even though microscopes were still simple.
- ② During the 1830s, botanist Matthias Schleiden concluded that every plant is made of cells. Zoologist Theodor Schwann compared animal tissues and concluded that animals are also made of cells. Their work connected many observations into a larger idea: all organisms are composed of one or more cells. A single-celled bacterium carries out every life process in one cell. In a tree or a human, many specialized cells work together to form tissues, organs, and the whole organism. Because cells provide structure and perform life processes, they are basic units of structure and function.
- ③ In 1855, physician Rudolf Virchow stated that every cell comes from another cell. As scientists watched cells divide, they saw one cell split to produce new cells. This evidence rejected the idea that cells simply appeared from nonliving material. Cell division helps a growing child add cells and helps a cut in skin repair. Modern microscopes reveal more detail, but cell theory still rests on the same linked claims: organisms contain cells, cells are the basic units, and new cells come from existing cells.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 How did Hooke's observation differ from Leeuwenhoek's observation?

2 What conclusion did Schleiden's work on plants and Schwann's work on animals support?

3 How does the passage show that cells are basic units of structure and function? Give one structure example and one function example.

4 What observation supported the claim that new cells come from existing cells, and what idea did this evidence reject?

3 YOUR TURN _____ Your own words

Create a three-panel model of a growing bean plant. In panel 1, show that the plant is built of many cells. In panel 2, zoom in on one root cell taking in water. In panel 3, show one cell dividing to make two cells, then write a caption under each panel.

PART 1 • READ AND MARK

Underline each scientist's name and what that scientist observed or concluded. Circle the three linked claims of cell theory so you can see how the evidence led to the theory. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	How did Hooke's observation differ from Leeuwenhoek's observation?	Hooke saw boxlike spaces in dead cork. Leeuwenhoek viewed living cells in samples such as pond water and blood.
2	What conclusion did Schleiden's work on plants and Schwann's work on animals support?	Their work supported the conclusion that all organisms are composed of one or more cells.
3	How does the passage show that cells are basic units of structure and function? Give one structure example and one function example.	In trees and humans, cells work together to form tissues, organs, and the organism's structure. A single-celled bacterium carries out every life process in one cell.
4	What observation supported the claim that new cells come from existing cells, and what idea did this evidence reject?	Scientists observed one cell dividing to produce new cells. This rejected the idea that cells simply appeared from nonliving material.

PART 3 • YOUR TURN (SAMPLE ANSWER)

Panel 1 caption: A bean plant is an organism made of many units that form its roots, stem, and leaves. Panel 2 caption: A root cell takes in water, showing that cells perform important functions. Panel 3 caption: One root cell divides into two cells, so the new cells come from a pre-existing cell.

Accept equivalent descriptions that accurately connect scientific observations to the three claims of cell theory. For the three-panel model, accept clear labeled sketches and captions showing multicellular structure, a cell function, and cell division producing new cells.