

Learning Target: I can read passages about the benefits of using microscopes to observe and learn about cells and then use the information gathered to answer multiple choice comprehension questions.

Cells & Microscopes Reading for Meaning

Long ago, people believed that diseases were caused by curses, bad air, or even evil spirits. Scientists had no way of knowing that the world around them was filled with living things too small to see with the naked eye. That changed in the 1600s with the invention of the microscope.

The first microscopes allowed scientists like Robert Hooke to observe the structure of cork, where he noticed tiny box-shaped compartments. He called them “cells” because they reminded him of small rooms. Later, Anton van Leeuwenhoek improved lenses and saw bacteria and tiny moving organisms in pond water, revealing a new hidden world.

Today, microscopes have advanced even further. Light microscopes can magnify living cells, while electron microscopes can magnify objects up to a million times, showing incredible details like ribosomes, mitochondria, and even viruses.

Cells are the building blocks of life. Every organism is made of one or more cells. Some, like bacteria, are single-celled and must carry out all life processes within one tiny unit. Others, like plants and animals, are multicellular, with cells that specialize for different jobs—muscle cells for movement, nerve cells for communication, and leaf cells for photosynthesis.

The microscope not only changed science but also changed medicine and technology. By learning about cells, scientists can understand diseases, develop treatments, and even create new technologies like genetic engineering. The study of cells reminds us that even the smallest structures can have the biggest impact on life.

Multiple Choice Questions (DOK 3 & 4)

1. Which of the following best explains why the invention of the microscope was a turning point in science?

- A. It allowed scientists to measure objects more accurately.
- B. It made invisible organisms and cell structures observable.
- C. It replaced the need for telescopes in science.
- D. It allowed scientists to predict the weather.

2. Hooke named the structures “cells” after small rooms. How does this comparison help explain what he saw?

- A. It shows that cells were empty spaces surrounded by walls.
- B. It explains that cells had doors and windows like real rooms.
- C. It proves that cells could only be seen in plants.
- D. It shows that cells were as large as building rooms.

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3. Which evidence from the passage best supports the idea that cells are the foundation of life?

- A. Microscopes can magnify up to a million times.
- B. Hooke saw box-like compartments in cork.
- C. Every organism is made of one or more cells.
- D. Scientists use microscopes to treat diseases.

4. A scientist observes a single-celled organism moving on its own. Based on the passage, which conclusion is most accurate?

- A. The organism must rely on other cells to survive.
- B. The organism is incapable of carrying out life processes.
- C. The organism can carry out all life processes in one cell.
- D. The organism is most likely a multicellular animal.

5. Which question would require using both a light microscope and an electron microscope to fully answer?

- A. What structures help a paramecium move?
- B. How large is a red blood cell compared to a grain of sand?
- C. What internal structures make up the mitochondria in an animal cell?
- D. How do plants and animals differ in the way they reproduce?

6. Compare how scientists' understanding of disease changed before and after the microscope. Which statement is most accurate?

- A. Before the microscope, scientists knew germs caused disease; after, they confirmed it.
- B. Before the microscope, diseases were blamed on spirits; after, scientists discovered microscopic organisms.
- C. Before the microscope, medicine was more advanced than after.
- D. Before the microscope, bacteria were known; after, they became invisible.

7. A student claims: "Cells don't really matter since they're too small to affect us." Which argument from the passage best disproves this?

- A. Cells were first observed by Robert Hooke.
- B. Cells can only be seen with a microscope.
- C. Cells are the building blocks of all living organisms.
- D. Microscopes have been improved over time.

8. Imagine microscopes had never been invented. Which field of science would be most limited today?

- A. Astronomy, because it studies stars.
- B. Genetics, because it studies how DNA works in cells.
- C. Meteorology, because it studies weather.
- D. Geology, because it studies rocks.

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9. Which higher-level conclusion can be drawn from the passage?

- A. Technology and science often advance together.
- B. Cells are more important than organisms.
- C. Microscopes are more useful than telescopes.
- D. Multicellular organisms are more powerful than unicellular ones.

10. Suppose a new microscope is invented that can see even smaller than an electron microscope. Based on the passage, which new discoveries might this allow?

- A. The ability to measure Earth's weather patterns.
- B. The ability to see parts of atoms inside molecules.
- C. The ability to see galaxies far away.
- D. The ability to grow larger plants.