

Active Reading

Section: Mitosis

Read the passage below. Then answer the questions that follow.

During its lifetime, a cell goes through a repeating sequence of cellular growth and division. This repeating sequence is called the **cell cycle**. A cell spends 90 percent of its time in the first three phases of the cycle, which are collectively called **interphase**. A cell will enter the last two phases of the cell cycle only if it is about to divide.

The five phases of the cell cycle are as follows:

First gap (G₁) phase: During the G₁ phase, a cell grows rapidly and carries out its routine functions. This phase occupies the major portion of the cell's life in most organisms.

Synthesis (S) phase: A cell's DNA is copied during this phase. At the end of this phase, each individual chromosome consists of two sister chromatids attached at the centromere.

Second gap (G₂) phase: In the G₂ phase, preparations are made for the nucleus to divide. Mitochondria and other organelles replicate. Hollow protein fibers called microtubules are assembled. The microtubules are used to move the sister chromatids during mitosis.

Mitosis: The process during cell division in which the nucleus of a cell is divided into two nuclei is called **mitosis**, each with a complete set of the cell's chromosomes.

Cytokinesis: The process during cell division in which the cytoplasm divides is called **cytokinesis**. In this process, each daughter cell receives about half of the original organelles in a cell.

SKILL: READING EFFECTIVELY

Read each question, and write your answer in the space provided.

1. Identify and define the two Key Terms in the first paragraph of this passage.

2. A cell viewed under a high-powered microscope appears to be in the fourth phase of the cell cycle. What does this indicate about the cell?

Active Reading *continued*

SKILL: SEQUENCING INFORMATION

Match each statement with the phase of the cell cycle it describes. Write the letter of the correct phase in the space provided. Some choices may be used more than once.

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| _____ 3. The nucleus divides. | a. first gap phase |
| _____ 4. It makes up a major portion of most cells' lives. | b. synthesis phase |
| _____ 5. The cytoplasm divides. | c. second gap phase |
| _____ 6. The mitochondria replicate. | d. mitosis |
| _____ 7. The cell grows rapidly. | e. cytokinesis |
| _____ 8. Two identical nuclei are produced. | |
| _____ 9. DNA is copied. | |
| _____ 10. Microtubules are assembled. | |
| _____ 11. Sister chromatids form and become attached at the centromere. | |
| _____ 12. The cell carries out its routine functions. | |
| _____ 13. Microtubules move sister chromatids. | |

Read the question, and write your answer in the space provided.

14. How are mitosis and cytokinesis alike? How do they differ?

An analogy is a comparison. In the space provided, write the letter of the term that best completes the analogy.

- _____ 15. G₂ phase is to mitochondria as S phase is to
- a. chromatids.
 - b. centromere.
 - c. microtubules.
 - d. DNA.