

Active Reading

Section: The Cell Cycle

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

The cell cycle is a repeating sequence of cellular growth and division during the life of an organism. 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 growth (G₁) phase: During the G₁ phase, a cell grows rapidly and carries out its routine functions. For most organisms, this phase occupies the major portion of the cell's life.

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

Second growth (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 chromosomes during mitosis.

Mitosis: The process during cell division in which the nucleus of a cell is divided into two nuclei is called mitosis. Each nucleus ends up with the same number and kinds of chromosomes.

Cytokinesis: The process during cell division in which the cytoplasm divides is called cytokinesis.

SKILL: READING EFFECTIVELY

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

1. What two key terms are contained in the first paragraph of this passage?

2. Give the meaning of these two terms.

3. 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?

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.

- _____ 4. nucleus divides a. first growth phase
- _____ 5. makes up a major portion of most cells' lives b. synthesis phase
- _____ 6. cytoplasm divides c. second growth phase
- _____ 7. mitochondria replicate d. mitosis
- _____ 8. cell grows rapidly e. cytokinesis
- _____ 9. two identical nuclei are produced
- _____ 10. DNA is copied
- _____ 11. microtubules are assembled
- _____ 12. forms two chromatids attached at the centromere
- _____ 13. cell carries out its routine functions
- _____ 14. microtubules move chromosomes

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

15. 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 or phrase that best completes the analogy.

- _____ 16. G₂ phase is to mitochondria as S phase is to
 - a. chromatids.
 - b. centromere.
 - c. microtubules.
 - d. DNA.