

## Skills Worksheet

# Active Reading

## Section: Regulation

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

The cell cycle has checkpoints. These are mechanisms the cell uses to make sure it is ready to go on to the next phase. There are three main checkpoints in the cell cycle.

The first checkpoint comes during the first gap phase. It is called the  $G_1$  checkpoint. Its purpose is to check the cell and its surroundings before cell division begins. The cell needs to be large enough and healthy enough to undergo cell division. It needs to have adequate nutrients and oxygen to sustain the process. If conditions are not favorable, the cell goes into a resting phase. If conditions are favorable, the cell enters the synthesis phase.

The second checkpoint comes during the second gap phase. It is called the  $G_2$  checkpoint. Its purpose is to ensure that the cell is ready for mitosis. As with the  $G_1$  checkpoint, the cell must still be large enough and healthy enough to continue cell division. The copied DNA must be identical to the original DNA. If there are mistakes in the copied DNA, enzymes correct the mistakes. If the cell is not large enough, the cell continues growing until it reaches the optimal size. When conditions are favorable, mitosis begins.

The third checkpoint comes during metaphase in mitosis. It is called the mitosis checkpoint. Its purpose is to check that the genetic material will divide properly into the two daughter cells. During the mitosis checkpoint, the cell makes sure that all the chromosomes have lined up properly at the cell equator. It checks to make sure that each chromosome is properly attached to the spindle. If chromosomes need rearranging or attaching or reattaching to the spindle, the cell makes these adjustments. When conditions are favorable, mitosis continues.

### SKILL: READING EFFECTIVELY

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

1. What is the general purpose of the checkpoints related to the cell cycle?

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2. Why are checkpoints important to the health of cells?

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**Active Reading** *continued*

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3. When does the G<sub>1</sub> checkpoint occur? What does the cell check?

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4. What happens if a cell does not pass the G<sub>1</sub> checkpoint?

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5. What happens if a cell passes the G<sub>1</sub> checkpoint?

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6. When does the G<sub>2</sub> checkpoint occur? What does the cell check?

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7. What happens if a cell does not pass the G<sub>2</sub> checkpoint?

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8. What happens if a cell passes the G<sub>2</sub> checkpoint?

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9. When does the mitosis checkpoint occur? What does the cell check?

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10. What happens if a cell does not pass the mitosis checkpoint?

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11. What happens if a cell passes the mitosis checkpoint?

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**Write the letter of the term that best answers the question.**

- \_\_\_\_\_ 12. Which graphic could you use to best show the checkpoints in the cell cycle?
- a. line graph
  - b. bar graph
  - c. flowchart
  - d. map