

Quiz: Mitosis and Differentiation

Read each question. Circle the letter of the correct answer.

1. During which phase of mitosis are chromatids separated?
 - A. metaphase
 - B. anaphase
 - C. telophase
 - D. prophase

2. One approach to gene therapy is to remove some of a patient's bone marrow stem cells and 'infect' them with a virus that contains a functional gene. The stem cells are put back into the patient's bone marrow, so that they can _____.
 - A. kill the cells that contain the faulty gene
 - B. spread throughout the body to other types of cells
 - C. stimulate the immune system to attack harmful cells
 - D. divide and make more blood cells with the functional gene

3. What happens to cells during differentiation?
 - A. They gain the ability to build entire organisms.
 - B. They develop specific structures and organelles.
 - C. They become stem cells and divide into zygotes.
 - D. They lose the potential to develop into any type of cell.

4. Mitosis is the process by which _____.
 - A. the cell rests
 - B. cytoplasm is divided
 - C. microtubules are assembled
 - D. the nucleus is divided into two nuclei

5. Which of these processes results in cells losing their potential to become any type of cell?
 - A. apoptosis
 - B. specialization
 - C. cytokinesis
 - D. differentiation

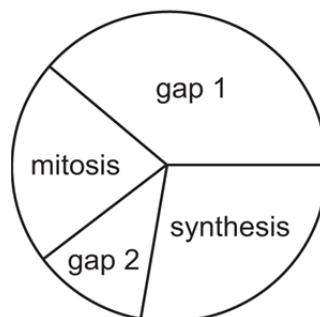
6. Cells in the body that can divide repeatedly and become other types of cells are called _____.
 - A. stem cells
 - B. embryo cells
 - C. connective cells
 - D. reproductive cells

7. How are mitosis and cytokinesis different?
 - A. Cytokinesis occurs in plant cells, while mitosis occurs in animal cells.
 - B. Cytokinesis occurs in animal cells, while mitosis occurs in plant cells.
 - C. Cytokinesis is the division of the cytoplasm, while mitosis is the division of the nucleus.
 - D. Cytokinesis is the division of the nucleus, while mitosis is the division of the cytoplasm.

8. Which of the following is not one of the cell layers found in vertebrates?
 - A. ectoderm
 - B. mesoderm
 - C. endoderm
 - D. middlederm

9. How is binary fission different from vegetative reproduction?
- A. Binary fission occurs slowly, while vegetative reproduction occurs rapidly.
 - B. Binary fission occurs in plants, while vegetative reproduction occurs in animals.
 - C. Binary fission is a type of asexual reproduction, while vegetative reproduction is a type of sexual reproduction.
 - D. Binary fission occurs in single-celled organisms, while vegetative reproduction occurs in multicellular organisms.

10. The pie chart shows the time associated with the stages in the cell cycle.

Cell Cycle

During which of the stages shown in the chart does the cytoplasm of a cell divide?

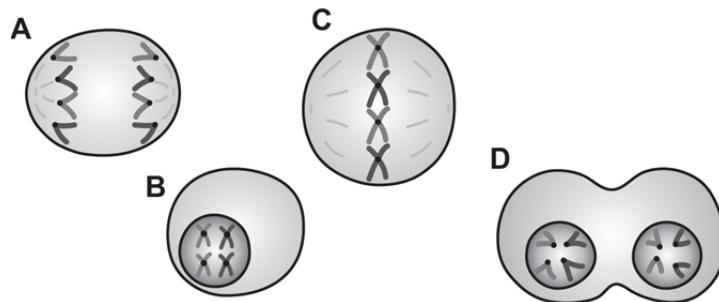
- A. gap 1
- B. gap 2
- C. mitosis
- D. synthesis

Read each statement. Write your answer on the lines.

11. Why are stem cells important in medicine?

12. The first couple of divisions of embryonic cells are considered totipotent. Nerve stem cells are considered multipotent. What can you infer would be the difference between totipotent and multipotent stem cells?

13. The diagrams show steps of a cell process.



What is the name of the process shown in the diagram? (The letters are for identification but do not indicate the order of the process.)

14. In what way are histones associated with DNA?

15. Describe the major chromosomal events that occur in each of the four phases of mitosis: prophase, anaphase, metaphase, and telophase.
