

Repaso de la sección

El ciclo celular

USAR TÉRMINOS CLAVE

1. Define los siguientes términos en tus propias palabras: *ciclo celular* y *citocinesis*.

COMPRENDER LAS IDEAS PRINCIPALES

- _____ 2. Las células eucarióticas
- a. no se dividen.
 - b. experimentan fisión binaria.
 - c. experimentan mitosis.
 - d. tienen pared celular.
3. ¿Por qué es importante que los cromosomas se dupliquen antes de la división celular?

4. Describe la mitosis.

DESTREZAS MATEMÁTICAS

5. La célula A tarda 6 horas en completar la división. La célula B tarda 8 horas en completarla. Después de 24 horas, ¿cuántas copias más habrá de la célula A que de la célula B? Muestra tu trabajo en el espacio en blanco.

Repaso de la sección (continuación)

RAZONAMIENTO CRÍTICO

6. Predecir consecuencias ¿Qué ocurriría si la citocinesis tuviera lugar sin la mitosis?

7. Aplicar conceptos ¿Cómo asegura la mitosis que una nueva célula sea igual a su célula madre?

8. Comparar Compara los procesos a través de los cuales las células animales y vegetales forman nuevas células. ¿En qué se diferencian los procesos?

7. Sample answer: Animals such as birds, insects, and mammals would be good on the island. Plants must be on the island in order to provide a source of food for the animals.

SECTION: THE CELL CYCLE

- Sample answer: The cell cycle describes all of the stages a cell goes through in its life. Cytokinesis is the last stage of cell reproduction when a cell's cytoplasm is split between the two new cells.
 - C
 - Chromosomes need to be copied so that the two new cells have the same genetic material as the parent cell.
 - Sample answer: Before mitosis begins, the chromosomes are copied. In phase 1, the nuclear membrane dissolves, and the chromosomes condense. In phase 2, the chromosomes line up along the equator of the cell, and homologous chromosomes pair up. In phase 3, the chromatids move to opposite sides of the cell. In phase 4, a nuclear membrane forms around the chromosomes, and the chromosomes unwind.
 - 8
 - If cytokinesis occurred without mitosis, each cell would only have half of the parent cell's genetic material or less.
 - Mitosis ensures that each new cell receives a copy of each chromosome, and hence, an exact copy of the parent cell's genetic material.
 - The processes of animal and plant cells are different because plant cells have cell walls. Cytokinesis is different in plant cells, but all other stages of mitosis are essentially the same as they are in animal cells.
- Active transport requires the cell to use energy to move substances. Passive transport does not require the cell to use any energy.
 - Cellular respiration releases stored energy by using oxygen. Fermentation releases stored energy without using oxygen.
 - C
 - A
 - D
 - C
 - Endocytosis and exocytosis are examples of active transport. In both processes the cell must change shape, wrap around a particle, and make other movements that require the cell to use energy.
 - Chloroplasts are needed for photosynthesis. Cellular respiration requires mitochondria.
 - The first stage is cell growth and copying of DNA (duplication.) The second stage is mitosis, which involves separating the duplicated chromosomes. The third stage is cytokinesis (cell division), which results in two separate, identical cells.
 - An answer to this exercise can be found at the end of the Teacher Edition.
 - The plant on the left was given pure water. The plant on the right was given salt water. Osmosis occurred in both plants. In the plant on the left, water moved into the plant because the concentration of water was lower in the plant than in the soil. So, the plant on the left did not wilt. In the plant on the right, the water in the plant moved into the soil, where the concentration of water was lower. The concentration of water in the soil was lower because the water contained salt. As a result, the plant on the right wilted.
 - When there is plenty of oxygen, the cells can get energy from cellular respiration. When there is a lack of oxygen, the cell must use fermentation, which doesn't produce as much energy. For fermentation to produce more energy, more food would be required.

Chapter Review

- Sample answer: Osmosis is the diffusion of water through a semipermeable membrane.
- Sample answer: Exocytosis is the process cells use to remove large particles; endocytosis is the process cells use to move large particles into a cell.
- photosynthesis
- cellular respiration
- Cytokinesis is the division of just the cytoplasm. Mitosis is the process in eukaryotic cells in which the nuclear material splits to form two new nuclei.