

Chapter 4 Cell Reproduction

I. Cell Division and Mitosis

A. Why is cell division important?

1. It's how multi-celled organisms increase the total number of cells (growth)
2. It's how worn out cells are replaced.
3. It's how single celled organisms reproduce

B. The Cell Cycle

1. A series of events that takes place from cell division to the next.
 - a. Organisms formation
 - b. Growth and development
 - c. Death
2. Length of Cycle
 - a. The time it takes for the cell cycle to occur
 - b. Cell cycle in some bean plants is 19 hours.
3. Interphase
 - a. a period of growth and development
 - b. After interphase, cell division begins
 - c. Cytoplasm separates and forms two new cells

C. Mitosis

1. The process in which the nuclei divide to form two identical nuclei
 - a. Each new nucleus is identical to the original nucleus
2. Steps of Mitosis
 - a. Chromosome
 1. Structure in the nucleus that contains hereditary material
 - b. Interphase
 1. Each chromosome duplicates itself
 2. Chromosomes coil into chromatids
 - c. Prophase
 1. Nucleolus and nuclear membrane disintegrate
 2. Centrioles move to opposite ends of the cell.
 3. Spindle fibers form
 - d. Metaphase
 1. Pairs of chromatids line up in center of cell
 2. Centromeres attach to spindle fibers
 - e. Anaphase
 1. Centromere divides
 2. Chromatids split
 3. Chromatids move to opposite ends of the cell
 4. Chromatids now called Chromosomes
 - f. Telophase
 1. Spindle fibers start to disappear
 2. Chromosomes start to uncoil
 3. New nucleus forms

3. Division of cytoplasm
 - a. In animal cells, the cell membrane pinches in the middle.
 - b. In plant cells, a cell plate forms and divides the cytoplasm and forms a cell wall
4. Results of mitosis
 - a. It is a division of the nucleus
 - b. Each is identical to each other and the original
 - c. Each has the same number and type of chromosomes
 - d. Human body cells have a nucleus with 23 pairs of chromosomes

D. Asexual Reproduction

1. A new organism is produced from one organism.
 - a. It's hereditary material will be identical to the parent.
2. Cellular Asexual Reproduction
 - a. Eukaryotic cells can reproduce asexually by cell division
 - b. Sweet potatoes can reproduce from sprouts
 - c. Strawberry plants reproduce from runners
 - d. Fission
 1. asexual reproduction in cells that don't have a nucleus
 2. bacteria
3. Budding and Regeneration
 - a. budding
 1. A new organism growing from the body of the parent
 2. A hydra reproduces by budding
 - b. Regeneration
 1. process that uses cell division to regrow body parts
 2. Sponges, planaria, sea stars use regeneration