Cell Growth and Division Chapter 10

Cell Reproduction

Section 1

Why Cells Reproduce

Key Idea: Because larger cells are more difficult to maintain, cells divide when they grow to a certain size.

Cell Size

- A cell grows larger by building more cell products.
- A cell's ability to exchange substances is limited by its surface area-to-volume ratio.

Cell Maintenance

- As a cell gets larger, more proteins are required to maintain its function.

Making New Cells

- Each new cell also gets an entire copy of the cell's DNA.
- Cells divide when they grow to a certain size.

Chromosomes

Key Idea: Eukaryotic DNA is packed into highly condensed chromosome structures with the help of many proteins.

- A gene is a large molecule of DNA that is organized into hereditary units.
- A chromosome is a structure of organized and packaged DNA.
- Chromatin is a substance made up of DNA and proteins.
- Histone is a group of proteins that help organize DNA into chromosomes.

- The nucleosome is a long DNA molecule that is wound around a series of histone cores in a regular manner.
- A chromatid is one of two thick strands of a fully condensed, duplicated chromosomes.
- The centromere is a region where identical pairs of sister chromatids are held together.

Chromosomes

- During most of a cell's life, its chromosomes exist as coiled or uncoiled nucleosomes.
- Each new cell has the same genetic information as the parent cell.

Preparing For Cell Division

Key Idea: All newly-formed cells require DNA, so before a cell divides, a copy of DNA is made for each daughter cell.

The word complex means a very complicated or involved arrangement of parts.

Prokaryotes

- The cytoplasm is divided when a new cell membrane forms between the two DNA copies.
- The cell is constricted in the middle, like a long balloon being squeezed near the center.

Eukaryotes

- The reproduction of eukaryotic cells is more complex than that of prokaryotic cells.
- Each new daughter cell must contain enough of each organelle to carry out its functions.