

Cell Cycle

How do cells produce more cells?

To grow and replace worn-out cells, an organism must make new cells. New cells are made from existing cells in a process called the **cell cycle**.

The cell cycle has several parts. First, a cell doubles in size and makes new organelles. The chromosomes in the nucleus

are duplicated, or copied. Each chromosome becomes two identical **chromatids**, held together by a **centromere**. The cell is preparing for **mitosis**. During mitosis, the cell's nucleus divides. Finally, **cytokinesis** happens. The cytoplasm divides, and two cells of almost equal size form.

Mitosis and Cytokinesis

Phase 1—During the first phase of mitosis, the nuclear membrane disappears. A football-shaped set of spindle fibers forms. The fibers attach to the centromeres that connect the chromatids.



Phase 2—The chromosomes line up along the middle of the cell.



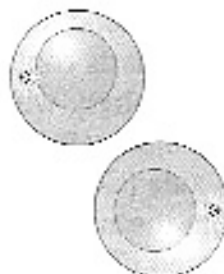
Phase 3—The two chromatids of each pair separate, becoming individual chromosomes, as the spindle fibers pull them to opposite sides of the cell.



Phase 4—The nuclear membrane reforms around each group of chromosomes. The spindle fibers disappear.



Cytokinesis—After mitosis is completed, the cytoplasm splits in two, forming two complete cells.



Show What You Know

Every cell needs a complete set of chromosomes in order to function properly. How does the process of mitosis ensure that each cell will have a complete set of chromosomes?
