

1. The first step in the process of a cell dividing is the replication of DNA. This process is called DNA replication and occurs during the S phase of the cell cycle. The DNA molecule is duplicated, creating two identical copies of the original molecule.

2. The second step is the condensation of the DNA molecules into chromosomes. This process is called chromatin condensation and occurs during the G2 phase of the cell cycle. The DNA molecules are tightly packed together, forming a compact structure that is visible as a chromosome.

3. The third step is the separation of the sister chromatids. This process is called sister chromatid separation and occurs during the M phase of the cell cycle. The two identical copies of the DNA molecule are pulled apart, one to each pole of the cell.

4. The final step is the division of the cell into two daughter cells. This process is called cytokinesis and occurs at the end of the M phase. The cell membrane and cell wall (in plant cells) pinch together, dividing the cell into two separate daughter cells.

Spindle Fibers



Diagram illustrating the structure of spindle fibers during cell division. The spindle fibers are shown as thin, thread-like structures extending from the poles of the cell towards the centromeres. The sister chromatids are shown as thick, rod-like structures held together at their centromeres.