

Mitosis "Flip" Book



Introduction:

Mitosis is a process of cell division which results in the production of two daughter cells from a single parent cell. The daughter cells are identical to one another and to the original parent cell. Only **somatic cells** (any cell besides sex cells, sperm and egg) reproduce by mitosis.

In a typical animal cell, mitosis can be divided into four principal stages:

- **Prophase:** During prophase the chromosomes coil up. They become shorter and fatter. The nuclear envelope seems to disappear. If you squash the cell and look at it under a microscope it is possible to see chromosomes and count them. You would see 46 chromosomes in a normal human cell.
- **Metaphase:** This is a very short stage in mitosis. The chromosomes move and line themselves up at the equator of the cell. It should be possible with a good microscope to see that each chromosome has divided into two daughter chromatids. These are genetically identical to each other.
- **Anaphase:** During anaphase the chromatids separate (are pulled apart) and move to the poles (opposite ends of the cell). You may be able to see spindle fibres which help to pull the chromatids apart. Although this stage only takes about ten minutes, it is the most interesting stage because it shows that the cell division is genetically exact.
- **Telophase:** Daughter chromosomes arrive at the poles and the microtubules disappear. The condensed chromatin expands and the nuclear envelope reappears. The cytoplasm divides, the cell membrane pinches inward ultimately producing two daughter cells (phase: Cytokinesis).

Objective: Students will create a flip book illustrating the changes to a cell during mitosis.

Procedure:

1. Cut the sections of cell division apart making sure each section is the same size.
2. Create a legend to color code the cellular structures visible in your flipbook. The following structures should be included in your legend.

Chromosome	Centriole
Cell Membrane	Spindle Fibers
Nuclear Membrane	Chromatin
3. Place all the pages in the correct order with your cover sheet on top and legend in the back. Include the a title, period and names of all group members on your cover sheet.
4. Staple your booklet down the left side so you can "flip" pages and see mitosis animated.
5. You may cut an edge of your book at an angle to create a staggered edge to help flipping.

Results:

Fill in the following table by entering the frame number range that corresponds to each of the phases of mitosis. Include a list of structures that can be seen in cells at each phase. If a structure can only be observed in a plant or animal cell, indicate so.

STAGES	FRAME NUMBERS (RANGE)	STRUCTURES THAT CAN BE SEEN IN CELLS
INTERPHASE		
PROPHASE		
METAPHASE		
ANAPHASE		
TELOPHASE		

