

Lab: Mitosis “Flip Books”

HONORS BIOLOGY: CELL ENERGY

Background: Mitosis is nuclear division plus cytokinesis, and produces two identical daughter cells during prophase, prometaphase, metaphase, anaphase, and telophase. Interphase is often included in discussions of mitosis, but interphase is technically not part of mitosis, but rather encompasses stages G1, S, and G2 of the cell cycle.

Purpose: For students to create a visual aid to help them understand the process of mitosis

Materials: 25 index cards
Markers, crayons, or colored pencils
Stapler
Diagram of stages of mitosis and cytokinesis
Optional:

- Cell phone app “Stop Motion”
- Any app or software to create stop motion animation
- Any materials you would like to use to create animation (i.e Play-Doh, string, etc.)

Method:

1. You can make your books (animation) as detailed as you want, as long as you realize you’ll be drawing a lot of very similar pictures.
2. To make a good flip-book (animation), each successive picture should vary a tiny bit from the preceding picture. When you flip the book, the animation should be fairly smooth. Suggest at least twenty or twenty-five pages in total.
3. Imagine mitosis as a smooth process. Mitosis doesn’t happen in 4 or 5 static frames, the way it’s depicted in textbooks. Emphasize the movement of chromosomes.
4. Use the textbook diagrams to help draw the cell in mitosis. Remember the changes to chromosomes, the nuclear membrane, spindle fibers, cell membrane, etc.
5. Make sure that you label all of the appropriate structures in **every** picture.
6. Optional:

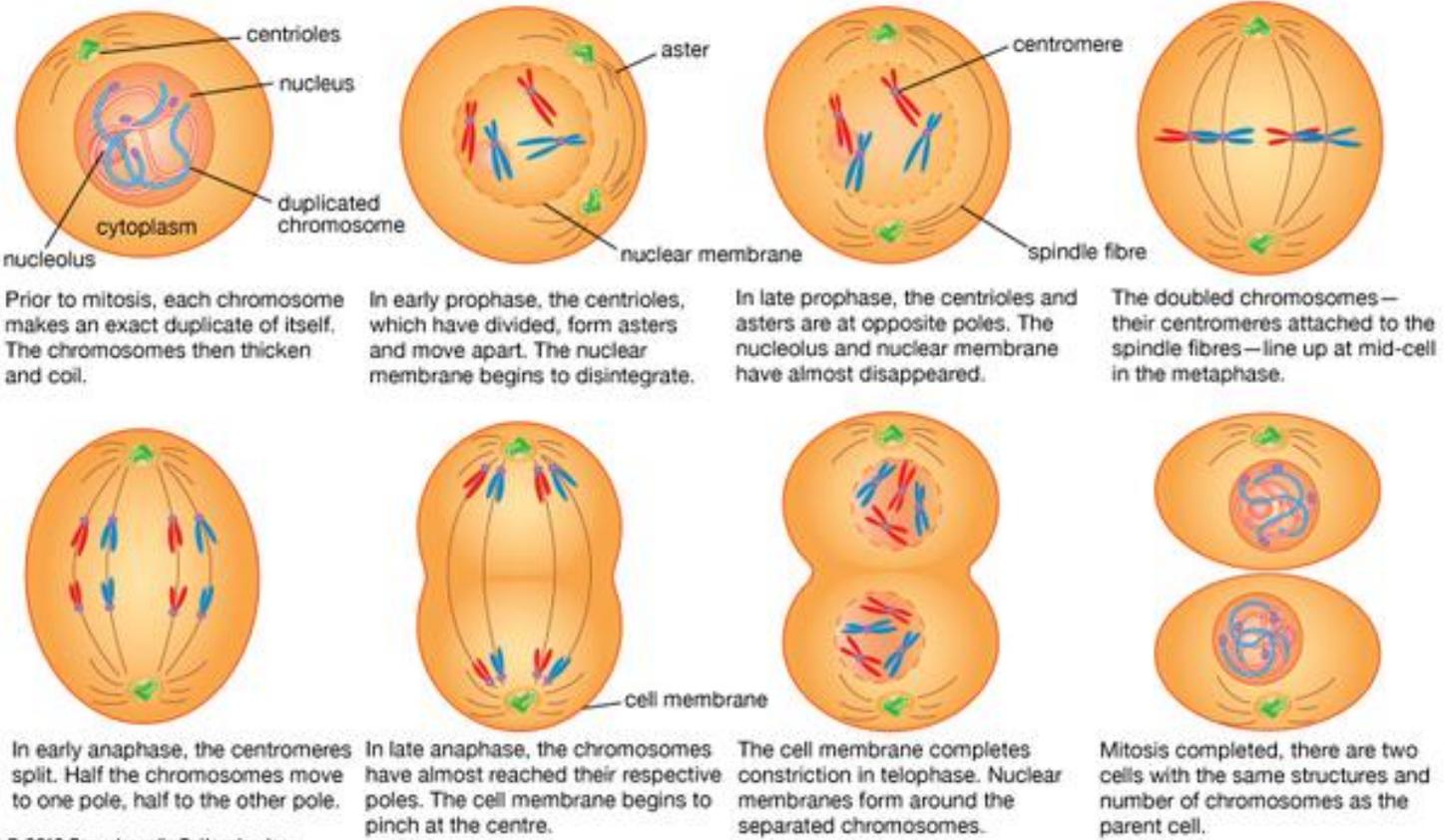
Assessment:

- Flip books analyzed for the correct depiction of the five phases (i.e., chromosome placement, presence of nuclear membrane)
- All the phases must be labeled along with the correct structures in the phases. Label the following structures: nuclear envelope, chromosomes (when visible), spindle fibers (when visible), centrosomes/centrioles (when visible).

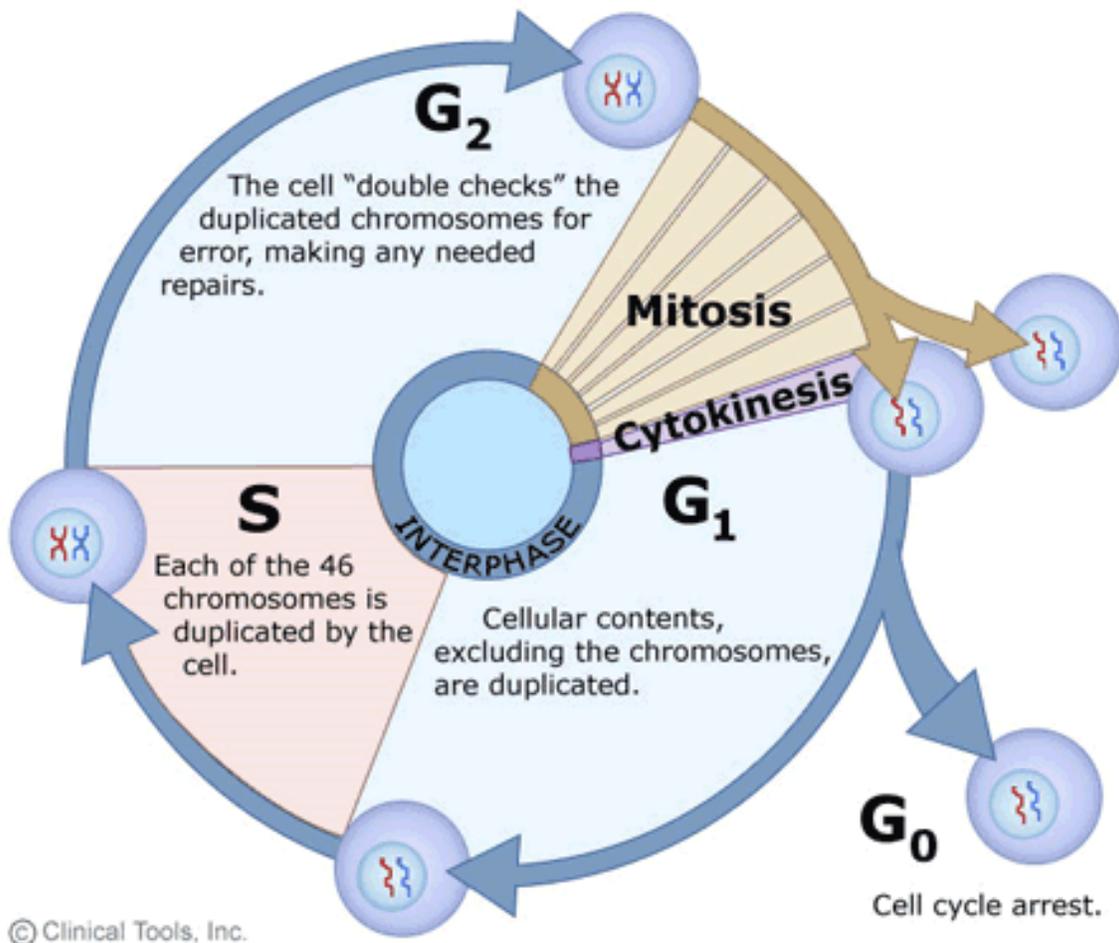
HELPFUL HINTS

- If you are creating animation with index cards draw your pictures close to the non-stapled edge of the index cards to make them easily visible as you flip through.
- Make sure that each picture is only slightly different from the previous one. Cell division is a fluid process, not a quick jump from stage to stage. You should have multiple pages for each stage of the cycle.
- Your book should begin and end with Interphase.

Mitosis, or somatic cell division



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