

**Topic:** Cell Cycle Flipbook

**Summary:** Students learn about the cell cycle by creating a flipbook animation.

**Goals & Objectives:** Students will be able to explain and list each phase of the cell cycle.

**Standards:** CA Biology 2a. *Students know* that meiosis is an early step in sexual reproduction in which the pairs of chromosomes separate and segregate randomly during cell division to produce gametes containing one chromosome of each type.

**Time Length:** 2 hours

**Materials:**

- 3x5 index cards – 17 for each student
- 4 Colored pencils per person
- Pictures of each stage of mitosis, can be from textbook

**Prerequisite Knowledge:** Difference between chromatin and chromosome. Cell organelles and the cytoskeleton.

**Procedures:**

1. Students first draw the circles for each phase and transition of the cell cycle.
2. Students then draw each phase of the cell cycle.
3. Students draw the transition for each phase of the cell cycle. Students may have a hard time with this since they cannot look up the pictures in the textbook. This is a great way for students to understand what is happening.
4. Students write in the correct labels for each phase card.
5. Students then create a color key on the last index card. You can give the students assigned colors if you like. Students then create a title card.

**Accommodations:** Students with an IEP can skip the transition cards and only create each phase of the cell cycle.

**Evaluation:**

This assignment is worth a total of 30 points. Look to see if cards are complete, accurate, colored consistently, labeled correctly, and aesthetic. Lower one letter grade for each missing item listed above.

## Cell Cycle Flipbook

### Objective:

You will be able to see the cell cycle in action by creating a flipbook animation that includes the three sub phases of interphase, mitosis, and cytokinesis.

### Color Pencils:

Mark the color pencil used: \_\_\_\_\_ DNA (chromatin, chromosomes, chromatids)  
\_\_\_\_\_ nuclear envelope  
\_\_\_\_\_ spindles  
\_\_\_\_\_ centrioles & microtubules

### Requirements:

- Circles for the 3 x 5 notes should be placed in the right center of the card. The diameter for the circles should be at least 5 cm.
- You will use colored pencils for DNA (chromatin, chromosomes, chromatids), nuclear envelope, spindles, and centrioles & microtubules on all the note cards.
- Do not color anything else
- Do not label the cards unless told.
- The note cards are stapled together in correct order.

### Procedure:

You are to draw the cell cycle as a flipbook animation. Start by numbering your cards sequentially in the top right corner. All odd numbered cards are the stages below.

1. Interphase (G1).
    - a. Draw the cell with organelles, microtubules, and chromatin in the nucleus. Do not draw a nucleolus or the centrioles.
  2. Interphase (S).
    - a. Draw the same as G1 but double the chromatin.
  3. Interphase (G2).
    - a. Draw the same as S but draw centrioles instead of microtubules.
  4. Prophase
    - a. For mitosis phases, do not draw the organelles.
  5. Metaphase.
  6. Anaphase.
  7. Telophase.
  8. Cytokinesis. The two separate cells are in interphase (G1).
- Draw a transition between each of the stages above. To draw the transitions, draw the in-between of the previous and following phases.
  - In the top right portion of all cards, number in sequential order.
  - On all odd numbered cards, write in the following four labels using small print.
    - In the top center of the card, write the phase name (leave transitions blank).
    - To the left of the cell, write the n value.
    - In the bottom right of the card, write diploid or polyploid.
  - Include a title card with the title, name, period, date and row.
  - Include a concluding card at the end with a color key.