**Chapter 10 Notes: “Cell Division & Stages of Mitosis”**

D.N.A.
1. __________ is the process when a cell divides forming two “daughter cells.
2. __________, or one of two identical “sister” parts of a duplicated chromosome.
3. A __________, is one of 2 tiny structures located in the cytoplasm near the nucleus that move to opposite sides of the cell to create the spindle network.

**Summary:** *Today I learned...*

**Learning Objectives**
1. I can explain why cells must remain small.
2. I can describe what occurs during the different stages of cell cycle.
3. I can summarize the cell cycle is controlled.

**Too Big to Fail**
1. More demand on the DNA
2. High surface area and low volume is good

**Solved by Cell division**
1. One large cell into 2 smaller cells

**The Cell Cycle**
- Life cycle of a cell: *(growth and division)*
  - Interphase: Cell grows & DNA is duplicated *(copied)* into sister *chromatids*.
  - **Cell Division**: 2 identical cells are created, each with one copy of the DNA.
- Mitosis (Prophase-Metaphase)
  - Chromatin/DNA condenses into chromosomes, while the nucleus is disappearing & the *centrioles* begin creating the *spindle* network.
- **Metaphase:**
  - Chromosomes line up across the center of the cell, with the *spindle* network attached to their *centromeres*.
- Mitosis (Anaphase-Telophase)
  - Sister *chromatids* separate into individual chromosomes, & move to opposite ends.
- **Telophase:**
  - Chromosomes lose their shape & a new nucleus is formed.
- Cytokinesis: Division of the cytoplasm.
  - Animal cells: The cell membrane pinches in splitting the cell into 2.
  - Plant cells: a new cell wall is created separating the 2 cells.

**Regulating Growth**
1. A protein called cyclin regulates the timing of the cell cycle.
   - Cancer cells do not respond to signals that regulate growth.
   - Grows & grows turning into a tumor
Directions: Color the above diagram, and draw/illustrate what happens during each phase of the cell cycle. Then answer the following questions for each of the 5 flaps listed above.

**Interphase, Prophase, Metaphase, Anaphase, Telophase:**

1. What occurs during this phase (be specific)?

2. Are the chromosomes visible?

3. Does anything stop or have to be finished in order for this phase to continue?