Name: _____

Date:_____ Period:_____

Cell Cycle Model

Objective:
You will be able to see the cell cycle in action by creating a physical model.

Objects for model:
State the object of each item: _____ DNA (chromatin, chromosomes, chromatids)
_____ nucleus
_____ cell membrane
_____ organelles

Requirements:

- You will use the different objects for DNA (chromosomes), nucleus, cell membrane, and organelles
- You can make a video presentation and explain what the cell cycle is. You will also describe what happens at each phase of interphase, mitosis, cytokinesis, meiosis
- If you would like, you can take pictures of your assignment at each phase, but your model in the photo must be physical.

Procedure:
You are going to take pictures or make a video of each phase of the cell cycle. First, create the model. Then take a picture before reconfiguring the model for the next step. Below are all the steps you need to model and take pictures of.

1. Interphase (G1).
    a. The cell includes organelles, cell membrane, nucleus, and DNA inside of the nucleus.
2. Interphase (S).
    a. The same as G1 phase but double the DNA.
3. Interphase (G2).
    a. The same as S-phase but double the number of organelles
4. Prophase.
    a. The nucleus disappears, and DNA coils to forms chromosomes
5. Metaphase.
    a. The chromosomes line up down the center
6. Anaphase.
    a. The chromosomes split in half and start moving towards the poles
7. Telophase.
    a. Two nuclei appear around both chromatids, and the center of the cell pinches in
8. Cytokinesis.
    a. The two separate cells are in interphase (G1).

Meiosis - Extra Credit

9. Meiosis I
    a. Eukaryotic cell division produces **haploid** sex cells or gametes (which contain a single copy of each chromosome) from **diploid** cells (which include two copies of each chromosome).
10. Prophase I

    a. Chromosomes begin to condense
    b. Homologous chromosomes pair crossing over occurs
    c. Recombinant chromosomes
11. Metaphase I
    a. Spindle fibers attach to chromosomes
    b. Chromosomes line up in the center of the cell
12. Anaphase I
    a. Chromosomes start to move to opposite ends as the spindle fibers shorten
13. Telophase I
    a. Chromosomes reach other ends
    b. Nuclear envelope forms
14. Cytokinesis
    a. Cell division occurs
15. Prophase II
    a. Chromosomes begin to condense
    b. Nuclear membrane dissolves
    c. Spindle fibers form
16. Metaphase II
    a. Spindle fibers attach to chromosomes
    b. Chromosomes line up in the center of the cell
17. Anaphase I!
    a. Centromeres divide, and sister chromatids move to opposite ends of the cell as spindle fibers shorten
18. Telophase II
    a. Chromosomes reach opposite ends of the cell
    b. Nuclear membrane forms
19. Cytokinesis
    a. Cell division occurs