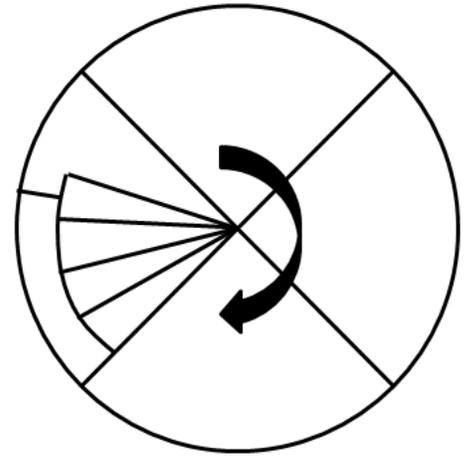


CP Cell Growth and Division Lab: Mitosis

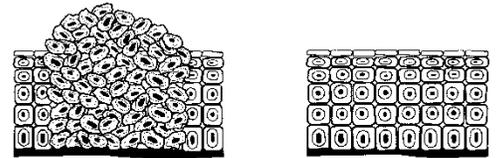
Name: _____

Introduction: A single human cell will divide to form two identical cells. Cells divide so that organisms can grow, to repair and replace old, damaged, or dead cells. A single cell will divide into two, each of these new cells will divide leaving four new cells. These four will each divide giving eight, then 16, 32, 64, 128, 256, and with time, trillions of new cells are produced (humans have over 100 trillion cells!). **Each new cell has IDENTICAL chromosomes (and genetic information) to the cell it came from.**



Part I: Pre-Lab Questions

- Using the blank circle to the right, place in the correct order the different phases of the cells cycle. Include the following terms: interphase, mitosis, G1, anaphase, metaphase, S, G2, telophase, and prophase.
- What are two problems that growth can cause for cells? _____
- How does cell division solve the problems of excessive cell growth? _____
- How do cancer cells differ from normal cells? Which diagram shows cancer cells? How do you know?



A

B

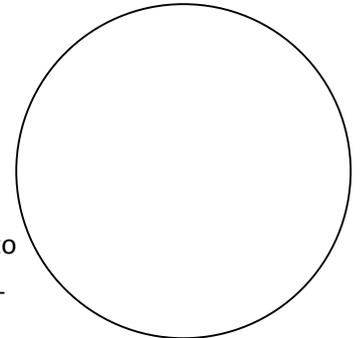
Part II: Microviewer

Slide 1 – The Zygote

- What is a zygote? _____
- What is chromatin? _____
- How many masses of chromatin are seen in this cell? _____
- Where did the masses of chromatin come from to form the zygote? _____ and _____
- What structure will the chromatin become in mitosis? *Circle your choice.* nucleus cytoplasm chromosome cell

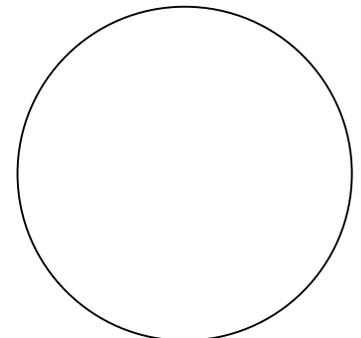
Slide 3 – Metaphase

- Draw the cell
- Where have the chromosomes moved? _____
- What structure of the cell is at the poles? _____
- Name the structures which connects the poles to each of the chromosomes?



Slide 5 – Early Anaphase (this is a transition from metaphase to anaphase)

- How has the number of chromosomes changed in this cell? What caused this change to occur? _____
- (Complete the sentence) "...there is enough _____ for _____..."
- What structure is helping the chromosomes move to the poles? _____



Slide 6 – Anaphase

- Draw the cell
 - What is happening to the chromosomes in this phase? _____
 - Where are the spindle fibers pulling the chromosomes? _____
- What are the spindle fibers made of? _____

Slide 7 – Telophase

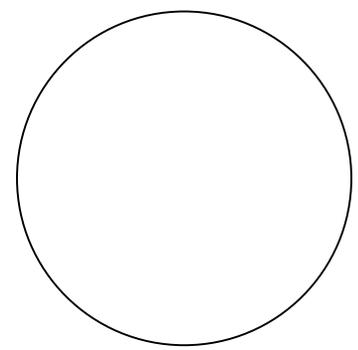
- Draw the cell (on back).
- What is happening to the cell membrane? _____

c. What is happening to the cytoplasm? _____

Slide 8 – Late Telophase (Cytokinesis)

a. What are the two new cells called? _____

b. What is the number of chromosomes in a human being? _____



Part III: Webquest

Mitosis Tutorial 1: Go to <http://www.cellsalive.com/>

➤ On the left side of the screen is a navigation bar, click on the link to “MITOSIS” Read the text on this page and view the animation, you can slow down the video by clicking step by step through the phases.

➤ Which stage does the following occur

1. Chromatin condenses into chromosomes _____
2. Chromosomes align in center of cell. _____
3. Longest part of the cell cycle. _____
4. Nuclear envelope breaks down. _____
5. Cell is cleaved into two new daughter cells. _____
6. Daughter chromosomes arrive at the poles. _____

➤ **Watch the video carefully:** The colored chromosomes represent chromatids. There is two of each color because one is an exact duplicate of the other.

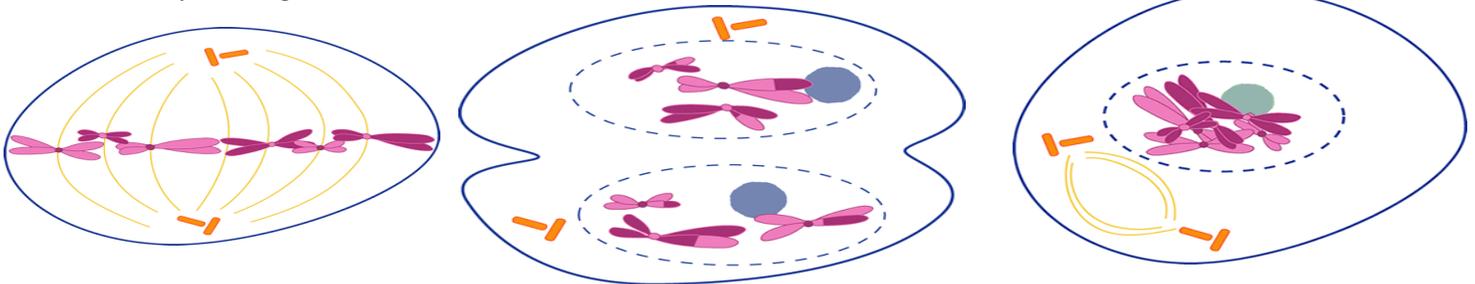
7. How many chromosomes are visible at the beginning of mitosis? _____

8. How many are in each daughter cell at the end of mitosis? _____

9. The little green T shaped things on the cell are: _____

10. What happens to the centrioles during mitosis? _____

11. Identify the stages of these cells:



Online Onion Root Tip: Go to

http://www.biology.arizona.edu/cell_bio/activities/cell_cycle/cell_cycle.html

1. Read the introduction, then click the “next” button.
2. You will have 36 cells to classify. When you’re finished, record your data in the chart below.

	Interphase	Prophase	Metaphase	Anaphase	Telophase	Total
Number of cells						36
Percent of cells						100 %

Part V: Analysis and Conclusion Questions

Answer the following questions relating to the daughter cells that result after telophase and cytokinesis have occurred.

1. How many new cells have now formed after the first division of the parent cell? _____
2. Has the chromosome number changed from the number found in the parent cell? _____
3. Are the chromosomes identical in each of the daughter cells? _____
4. Are the chromosomes in the daughter cells identical to the parental (original) cell? _____