

Mitosis Cell Cycle Microscope Lab

Biology A

Name _____ Period _____

Purpose:

To observe and sketch 5 stages of the cell cycle and to determine the relative amount of time elapsed for each stage.

Procedure:

1. Obtain a slide of an onion root tip. Place the slide under scanning power so that when you look through the scope the root tip appears to be pointed down.
2. Locate the region of cell division (ROCD). See Figure 1. Move the slide so that the ROCD is in the center of the field of view (FOV).
3. Focus perfectly and move to low power. Again, center, focus and move to high power.
4. Under high power, locate and sketch cells at each of the following phases in the cell cycle:
 - a. Interphase
 - b. Prophase
 - c. Metaphase
 - d. Anaphase
 - e. Telophase
5. You may use Google image search to help you to identify phases.
6. Be sure to use the Sheldon Sketch Criteria® (see next page). Sketches should represent the cells at the size you see them. You may combine separate fields of view to include multiple phases in one sketch. Sketches will be placed on the templates at the end of this handout.
7. In your sketches, label the following cell parts (in the appropriate stages where the parts are visible):
 - a. Cell membrane
 - b. Nuclear envelope
 - c. Spindle fibers
 - d. Chromatin
 - e. Chromosomes
 - f. Chromatids
 - g. Cell plate

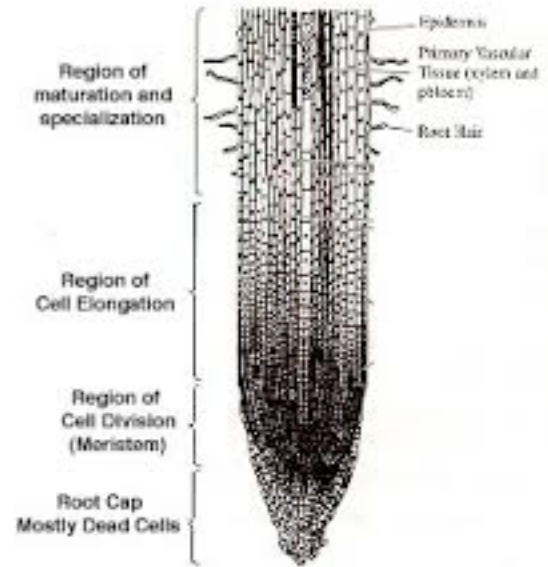


Figure 1: Sagittal section of an onion root.

Mitosis Cell Cycle Microscope Lab

Biology A

- Compare the length of time for each of the cell cycle stages. To do this: while looking at the ROCD under high power, count the total number of cells within your FOV (without moving the slide) in each of the phases. Fill in the table below.

Title: _____

Phase	Number of cells visible

- Obtain a slide of **one** of the following: whitefish, Ascaris, grasshopper testes.
- Locate cells at each of the stages and repeat steps 4 – 7. Substitute *cleavage furrow* for *cell plate* in your labels.

For Lab Practical Exam: Be able to answer the following questions.

- Describe the differences in the cell division of plant and animal cells. What might account for those differences?
- Based on the data from your table from step 8 in the procedure, what can you infer about the length of time a cell spends in each stage of the cell cycle?

Sheldon Science Sketch Criteria®

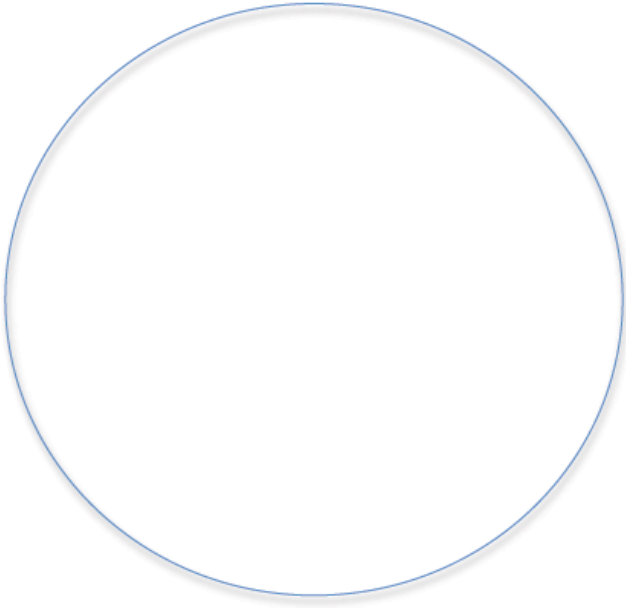
- Use **pencil** for any sketched data (ink may be used for labeling)
- Draw within a **large** field of view (FOV) (approx. 5-8cm is a good diameter for the FOV)
- Do high **quality** work; sketch your area of interest perfectly. Make it look exactly as it appears under the microscope. The remainder of the FOV must be sketched to provide context, but the quality of the sketch may be quite rough.
- Label** your observations with as much of the following information as possible:
 - Title of the object of interest
 - Use a ruler to draw label lines
 - Include total magnification of the FOV
 - Include size (in μm^2) of your object of interest.
 - Label on the right-hand side of the drawing, if possible. Note any structures that you can identify. Are there structures that you don't know yet?

*see table below for compound scope scales (note: 1mm = 1000 μm)

Objective	FOV total mag	FOV size (mm)
Scan	40x	5.0
Low	100x	2.0
High	400x	0.5

Mitosis Cell Cycle Microscope Lab
Biology A

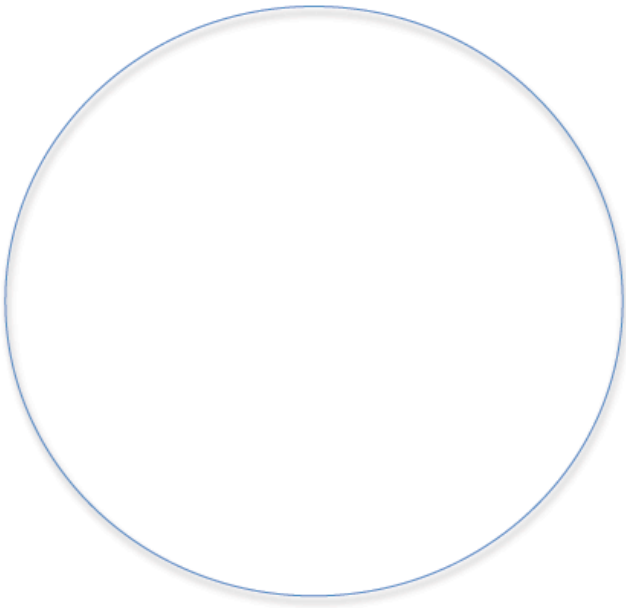
Title: _____



Total Magnification: _____

Estimated width of one cell: _____

Title: _____

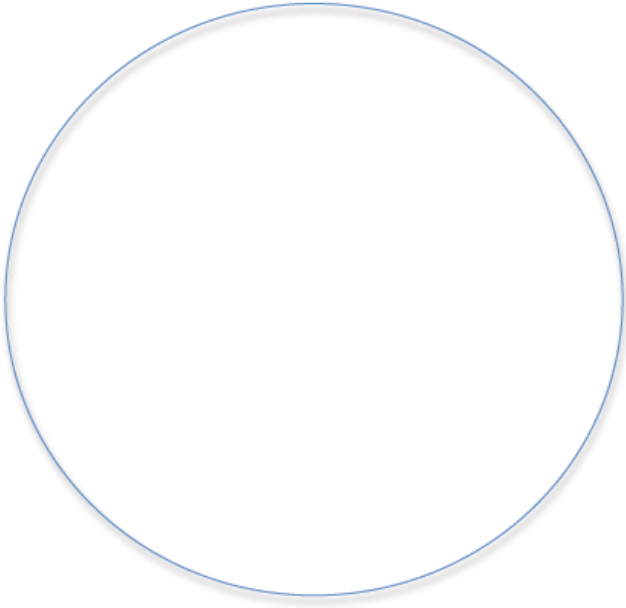


Total Magnification: _____

Estimated width of one cell: _____

Mitosis Cell Cycle Microscope Lab
Biology A

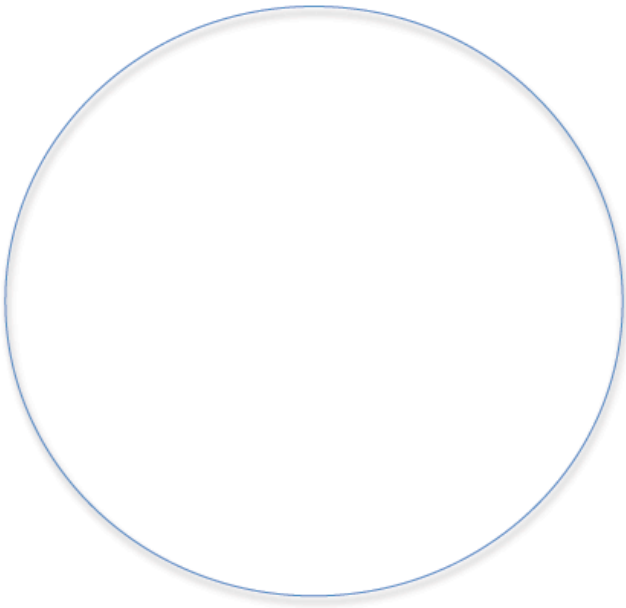
Title: _____



Total Magnification: _____

Estimated width of one cell: _____

Title: _____

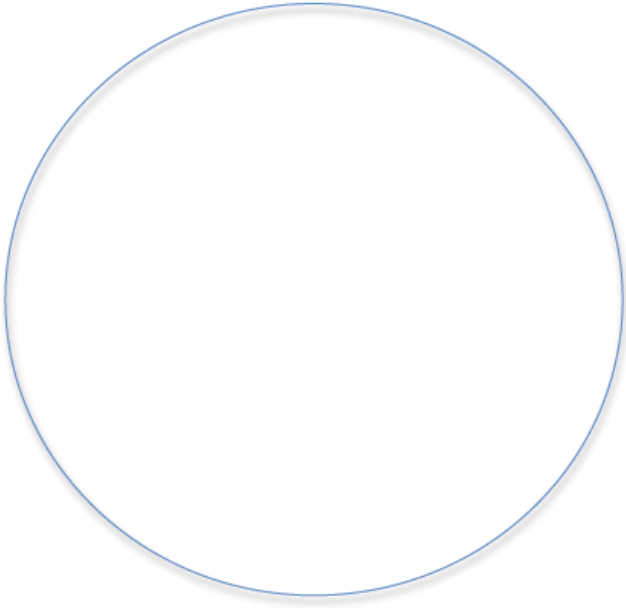


Total Magnification: _____

Estimated width of one cell: _____

Mitosis Cell Cycle Microscope Lab
Biology A

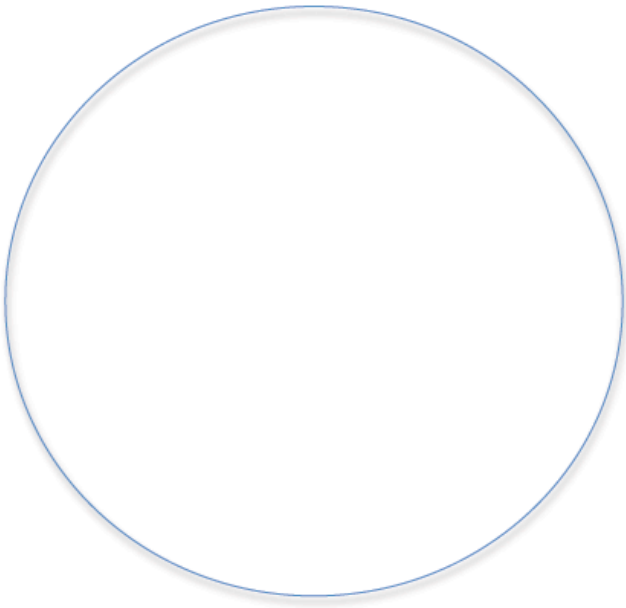
Title: _____



Total Magnification: _____

Estimated width of one cell: _____

Title: _____



Total Magnification: _____

Estimated width of one cell: _____