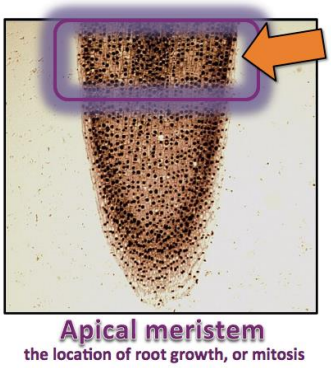
Mitosis Timeline Virtual Lab
Lab Directions

This lab activity is a virtual lab, meaning you will conduct all of it online. Read through all the directions before beginning. Submit your lab report according to the directions and grading rubric below.

Overview: In this activity, you will examine a photograph of cells from the growing tip of an onion root and predict the duration of each stage of mitosis. Not all of the root cells are dividing, as the image below shows you; only the region of the root called the **apical meristem** will have cells that are actively dividing using mitosis. Take a look at a slice of this region of the onion root:



You will not be submitting a full lab report, but rather a hypothesis, table, graph and answers to thought-provoking discussion questions. The rubric for grading is below.

Goal: Predict the length of time that onion cells spend in each phase of the cell cycle.

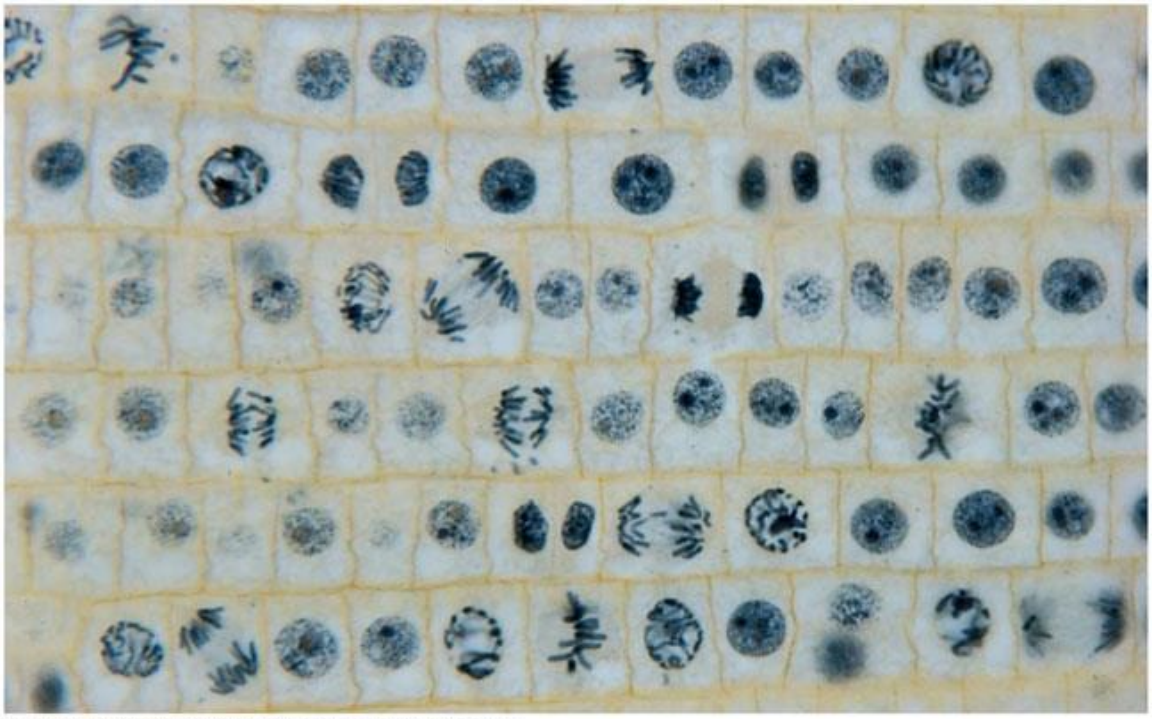
Hypothesis: Think about your learning on mitosis and the cell cycle so far. Make a prediction about how many minutes/hours each phase lasts:

- Interphase
- Prophase
- Metaphase
- Anaphase
- Telophase

Directions:

Collect Data: Examine the photograph at this link:

http://andrewhulse.weebly.com/uploads/1/7/7/7/17772039/9151138_orig.jpg



For each of the cells pictured, decide it's phase. Keep a tally of how many are in each phase; record the total in the first row of the table below. Sometimes it is most helpful to work in rows of cells so that you can keep track of where you leave off. If there is not a nucleus visible, do not include that cell in the count.

Calculate:

1. Record your number of each stage in the first row of the table. Be sure your total cells counted was between 50-60.

2. Percent of cells in each phase: For each phase, divide the number of cells in that phase by the total number of cells. Record this as a percent in the second row and check that this row adds up to 100%.

   Example: You counted 15 metaphase cells out of 60. 15/60 = 0.25 (25%)

3. Hours Spent in Each Phase: Multiply your *decimal* percent by 24 hours. Record this in the third row. Check that this row adds up to 24 hours.

   Example: 25% of your cells were in metaphase. 0.25 x 24 = 6 hours

Table 1. (Your title here)

	Interphase	Prophase	Metaphase	Anaphase	Telophase	Total
Number of Cells in each stage						**50-60?** your total here
Percent (%) of cells in each stage						**100%**
Hours spent in each stage						**24 hours**

Discussion Questions:

Answer each question in thoughtful, detailed and complete sentences.

1. What phase are most cells found in? Was your hypothesis supported?
2. Which phase takes the longest to complete? Explain why this makes sense.
3. Which phase is the shortest in length? Explain why this makes sense.
4. Some drugs used to fight cancer interfere with spindle fibers doing their job. Describe how this would stop cancer cells from increasing in number.
5. How does mitosis help an organism to grow in size?

Grading:

The following criteria will be used to evaluate your lab:

Criteria	Points Possible
Introduction State Hypothesis only ● If-then statement ● Includes prediction for each phase ● Testable ● Full sentence, proper spelling/grammar	5
Results Data Table ● Properly set up per example ● Accurate data for counted phases (row 1) ● Each calculation is done properly (row 2,3)	20
Discussion Questions ● 5 points per question ● Answered in complete sentences	25
TOTAL	**50**

from http://cms.gavirtualschool.org/Shared/Science/Biology17/CellReproduction/Biology_CellReproduction_Shared4.html