LAB # ____Plant and Animal Cells

Lab Instructor_____ Name_____

Date _____ Period_____

Objective: To compare the structure of plant and animal cells

******Use full sentences when answering all questions.******

Pre-Lab

1. How big is a typical cell?

2. One millimeter contains 1000 microns. Convert the following. Show your work
   a. How many millimeters are in 100 microns?

   b. How many microns are in 5 millimeters?

   c. Convert your height into microns. Show your work:

LAB

Materials

Chunks of red onion, compound light microscope, lens paper, slides, cover slips, prepared animal cell slides, forceps, transparent metric ruler, Lugol's solution, paper towels

Procedures and Observations

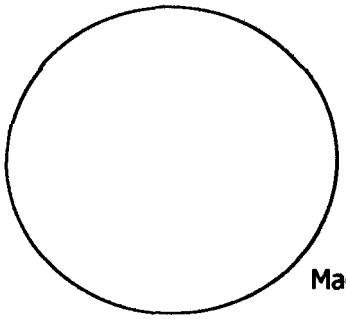
A. *Observing characteristics in plant cells.*

1. Take a piece of the inner layers of an onion chunk.
   a. Use the forceps to carefully peel off a small piece of thin skin from the CONCAVE side of the layer. Make a temporary "wet mount" of this piece of the onion skin.
   b. Examine the specimen using the 10X objective lens. Record all observations here.

2. Put a small piece of paper towel on one side of the cover slip. Carefully add some drops of the Lugol's solution on the opposite side. The paper towel should soak up extra liquid, hence pulling through the solution.
   a. Observe the cells using the 10X objective lens. Draw the onion cells and label the cell wall, cytoplasm, vacuole and nucleus. Write the *total* magnification in the space provided.
   b. How did the specimen change when Lugol's solution was added?

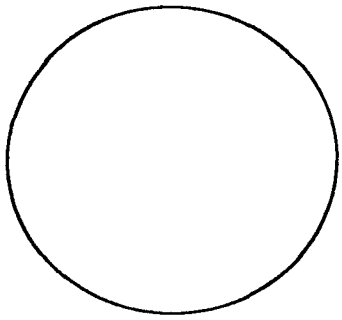
   c. **Carefully** switch to the high power (40X) objective. Draw the onion cells and label the cell wall, cytoplasm, vacuole, cell membrane and nucleus. Write the *total* magnification in the space provided.

ONION EPIDERMIS (low power)



Magnification _____X

ONION EPIDERMIS (high power)



Magnification _____X

3. Remove the slide. Using the **10X objective**, place the ruler across the widest part of the stage opening so that the millimeter edge faces you.
   a. Focus the microscope so that the millimeter markings are clear.
   b. Describe how the image of the ruler differs from its actual position.

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4. Move the millimeter markings so that one of the lines is at the end of the field of diameter. Estimate the field diameter by noting the number of millimeter lines in view. *What is the diameter of the field? Show all work.*

In Millimeters: _____ In Micrometers: _____

5. Center the onion slide that you prepared over the stage opening.
   a. Use the 10X objective, count the number of cell lengths along the field diameter.
   b. Count the number of cell that fit width-wise across the field (from top to bottom).

Dimension	# of cells	Average length in mm	Average length in microns
Length (1st count)			
Length (2nd count)			
Width (1st count)			
Width (2nd count)			

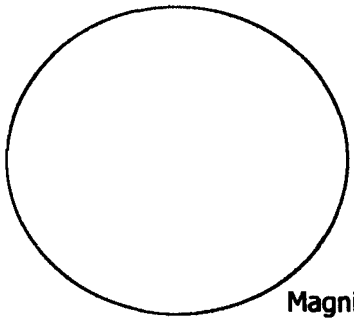
6. Calculate an estimate of the average length and width of an onion cell in microns:

Length: _____ Width: _____

B. *Observing animal cell characteristics.*

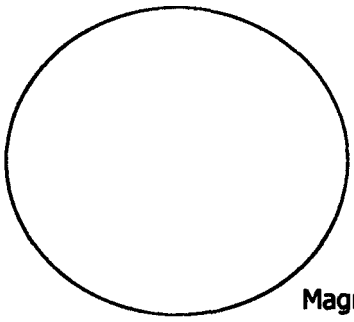
1. Observe the prepared animal cell slide and draw and label the cytoplasm, vacuole cell membrane and nucleus.

ANIMAL CELL (low power)



Magnification _____X

ANIMAL CELL (high power)



Magnification _____X

2. Repeat Part A, step #5 using the prepared animal cell slide.

Dimension	# of cells	Average length in mm	Average length in microns
Length (1st count)			
Length (2nd count)			
Width (1st count)			
Width (2nd count)			

3. Calculate an estimate of the average length and width of an animal cell in microns:

Length: _____ Width: _____

4. Is it acceptable to use your estimations of cell size as a standard for use in scientific work? Why or why not?

5. How does your height in microns compare mathematically to the plant and animal cell lengths?

C. *Compare and Contrast plant and animal cells.*

Fill out the two charts using your observations in this lab and your prior knowledge.

ANIMAL CELL	HOW ARE THEY DIFFERENT? WITH REGARD TO	PLANT CELL
	ENERGY	
	STRUCTURE & SIZE	
	ORGANELLES	
	MOBILITY	
	FUNCTION	

Plant and Animal Cells

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Period_____

Name_____

Period_____

ANIMAL CELL

PLANT CELL

HOW ARE THEY ALIKE?

PATTERNS OF SIGNIFICANT SIMILIARITIES AND DIFFERENCES:

CONCLUSION OR INTERPRETATION: