New Paltz High School
Science Department

Name:……..…….……**Due Date**…. ...

Lab Title:…*Measuring With Microscopes*…….**Lab #**...…

Lab Partners:……

Your Lab Score will be based on the following:

Neatness: All labs must be **well-written and done in pencil** unless directed otherwise. There are to be no cross-outs or misspelled words. Questions should be answered in complete sentences.

Accuracy: Certain **questions will be checked** for accuracy.

Completeness: All questions are to be answered completely. There are to be **NO BLANKS** or incomplete sections.

Lab Class Procedure: You are to **follow directions** and use lab equipment properly, work for the entire period, and follow proper clean-up procedures

Rubric:

Lab Score Category	Points Earned
Neatness	0 1
Accuracy	0 1 2 3 4
Completeness	0 1 2 3
Lab Class Procedure	0 1 2
Total Lab Score	0 1 2 3 4 5 6 7 8 9 10

You are to submit all lab material with this lab report:

Comments:

Mr. Ulrich/Mrs. Ryan
Biology

How Big Is This Thing?

Purpose: When looking through a microscope, it is often difficult to recognize exactly how big (or small) the thing you are looking at actually is. In this lab you will measure the field of view under scanning power (4X), calculate the field of view under high power (40X) and use those measurements to estimate the length of a *Paramecium*. A *Paramecium* is a single-celled organism in the kingdom Protista.

Step One: Determining the field of view under scanning power

A. Make a wet mount of a one centimeter square piece of millimeter graph paper.
B. With the scanning objective in place, determine the field of view diameter by counting the squares. Each square is one millimeter. Estimate the nearest tenth of a millimeter.
C. How big is your low power field of view?

Step Two: Converting to micrometers

D. Use the following formula to convert from millimeters to micrometers using the following formula: 1 mm = 1000 µm (µ = micro). Record your scanning power field of view in µm here. INCLUDE UNITS!

Step Three: Calculate the high power field of view.

E. The high power field of view is too small to measure directly with the millimeter graph paper. Field of view diameter is inversely proportional to magnification so all you have to do is set up the proportion and cross multiply. Set up your proportion as follows:

$$\frac{\text{High power magnification}}{\text{Scanning power magnification}} = \frac{\text{Scanning power field of view in µm}}{\text{High power field of view in µm}}$$

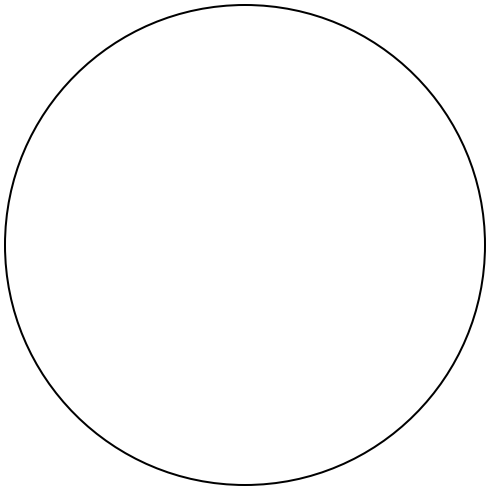
F. Set up your proportion and cross multiply (show your work) below: INCLUDE UNITS! (magnification has no units)

G. What is the diameter of the high power field of view in µm? INCLUDE UNITS!

Step Four: Measuring the *Paramecium*.

H. Get a pre-prepared slide of *Paramecium*. Using proper microscopy technique, get a *Paramecium* cell in focus under high power. *Paramecia* are oval and stained blueish with a purple nucleus.

I. Sketch the high power field of view in the circle below:



J. Estimate how many *paramecia* would fit lined up, end to end across the diameter of your field of view. Estimate to the nearest tenth of a cell. How many would fit?

Step Five: Calculating the length of the *Paramecium*.

K. Now that we have the diameter of the field of view and the number of cells that fit across the diameter of that field of view, it is a simple calculation to determine the length of the cell. Use the following formula to calculate the length of the cell:

$$\frac{\text{High power field of view diameter in } \mu m}{\text{Number of } \textit{Paramecia} \text{ that fit}}$$

L. Show your calculations below. INCLUDE UNITS!

M. How many micrometers is the *Paramecium*? INCLUDE UNITS!

Conclusion Question:

1. When have you had to convert units outside of class? Which units did you convert from and to?