

Microscope Worksheet:

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*Calculating Magnification. Converting Measurements, Estimating cell size,  
Calculating Field of View, Scale*

**1. Calculate total magnification: Ocular x Objective**

Ocular	Objective	Total Magnification
10X	4X	
15X	10X	
5X	12X	
10X	10X	
10X	40X	

**2. What are the possible magnifications of a microscope with an ocular marked 10X and objectives marked 5X, 15X, 30X and 60X?**

**3. Convert the following measurements: 1mm = 1000 $\mu$ m**

- a. 9.2 mm =
- b. 5900  $\mu$ m =
- c. 0.083 mm =
- d. 61000  $\mu$ m =

**4. Estimating cell size: (Divide the field of view by the number of cells that occupy the diameter.)**

- a. The field of view is 2500 $\mu$ m. If a cell takes up 1/5 of the field of view, how long is the cell?
  
  
  
  
  
  
  
  
  
  
- b. A student counts 50 cells across the diameter of the field of view, and there are 70 rows of cells. If the diameter of the field of view is 3500  $\mu$ m, what is the length and width of the cells?

5. Calculate magnification/field diameter
- A microscope has a low power magnification of 40x and a field of view of 7mm. Determine the field of view of medium power if the magnification increases to 150X. Please write your answer in micrometres. (hint: cross multiply)
  - A specimen is 40um in length. The specimen can fit across the field of view 10 times under high power with a magnification of 450x. Determine the magnification of medium power if the medium power Field of view is 1.5mm. (hint: cross multiply)

**6. Scale: (Divide diagram size by actual size.)**

- An organism has an actual length of 0.050mm. If you draw a diagram which is 75.0mm, what is the magnification?
- An organism has an actual length of 0.060mm. If you draw a diagram which is 36mm, what is the magnification?
- An object has an actual length of 0.025mm. If you use a scale of 1:1000, what will be the size of the drawing?
- An organism has an actual length of 0.033mm. If you use a scale of 1:250, what will be the size of the drawing?

