

Microscope Worksheet:

*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 μ m

- a. 9.2 mm =
- b. 5900 μ m =
- c. 0.083 mm =
- d. 61000 μ 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 μ 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 μ m, what is the length and width of the cells?

5. Calculate the field of view: Use a ratio. As magnification increases, field of view decreases.

- a. **(1:1)** Low power: $4X = \frac{5000 \mu\text{m}}{\quad} = \quad \text{mm}$
- b. **(2:5)** Medium power: $10X = \frac{\quad \mu\text{m}}{\quad} = \quad \text{mm}$
- c. **(1:10)** High Power: $40X = \frac{\quad \mu\text{m}}{\quad} = \quad \text{mm}$

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

- a. An organism has an actual length of 0.050mm. If you draw a diagram which is 75.0mm, what is the magnification?
- b. An organism has an actual length of 0.060mm. If you draw a diagram which is 36mm, what is the magnification?
- c. 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?
- d. 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?

