

Name:

Working with a Microscope

In microscopy, most measurements are given in micrometers (um) rather than in millimeters (mm). “Micro” means one-millionth, while “Milli” means one-thousandth; there are one million micrometers in a meter, and one thousand millimeters in a meter. This means that there are 1000 um in 1mm. Try the following conversions:

a) 3000 um = _____ mm

e) 2.5mm = _____ um

b) 100 um = _____ mm

f) 0.75 mm = _____ um

c) 1.0 mm = _____ um

g) 2.5 um = _____ mm

d) 0.03 mm = _____ um

h) 220 um = _____ mm

- Fill in the table below to indicate that you know the power of magnification of each lens combination.

POWER	OCULAR LENS	OBJECTIVE LENS	TOTAL MAGNIFICATION
Low Power	10 X		
Medium Power		10X	
High Power			400 X

- In order to estimate the size of a specimen or object under the microscope we must compare the size of what is being observed to the size of the field of view (the circle of light you see when looking through the scope). In other words you must first know the how big the field of view (FOV) is for each power. This can be determined by using a ruler under low power. Use your formulas to fill in the rest of the chart.

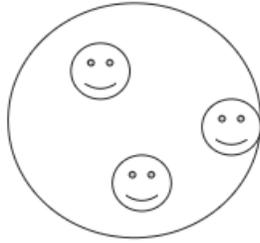
Power	Total Magnification	Field of View (mm)	Field of View (um)
Low Power		2.5mm	
Medium Power			
High Power			

Actual (Estimated Cell Size)

1. Calculate the actual size of one cell in each of the following microscope images, as seen on low power. Assume the FOV is 2.5 mm. Show calculation

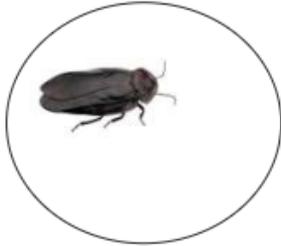
Name: _____

A.



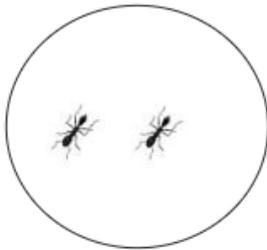
Actual size of one cell: _____ mm

C.



Actual size of one cell: _____ mm

D.



Actual size of one cell: _____ mm

Drawing Magnification

1. An organism has an actual length of $50\mu\text{m}$. If you draw a diagram which is 75.0 mm , what is the magnification? Show all work

2. An organism has an actual length of $60\mu\text{m}$. If you draw a diagram which is 36mm , what is the magnification? Show all work