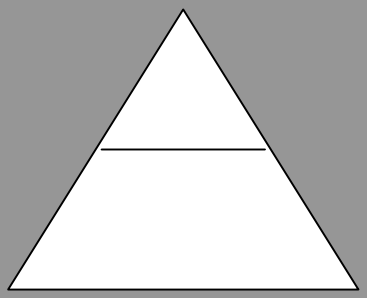
Calculating Magnification

MAGNIFICATION: the number of times larger an image is compared with the real size of the object.

You need to learn this equation!!

magnification = size of image / actual size of specimen

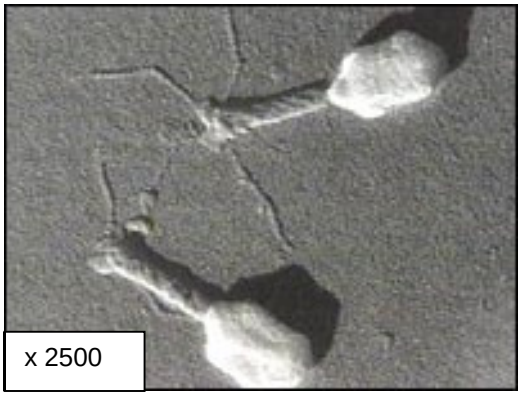
You also need to be able to rearrange this equation.
This triangle might help.



You need to be able to use this equation to work out the actual size of an image when you know the magnification, or be able to work out the magnification if you know the actual size.

The key trick is to always make sure that your measurements are in the same units. Most of the time this will be micrometers μm

A worked example



Q: What is the actual size of the head of this virus?

Step one:
Measure the length of the head (image size): 17mm

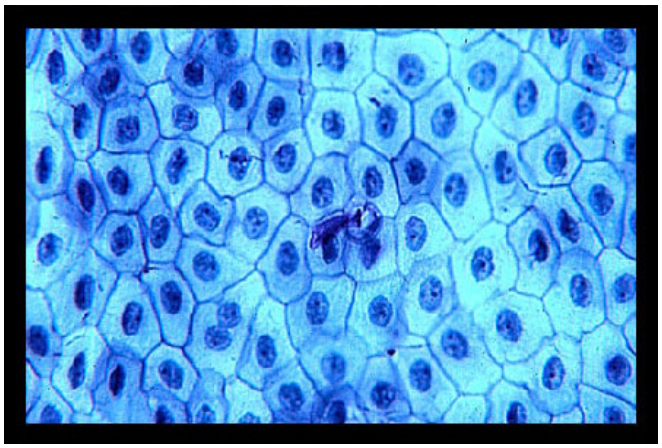
Step two:
Convert this measurement into μm : 17000μm

Step three:
What is the magnification? x 2500

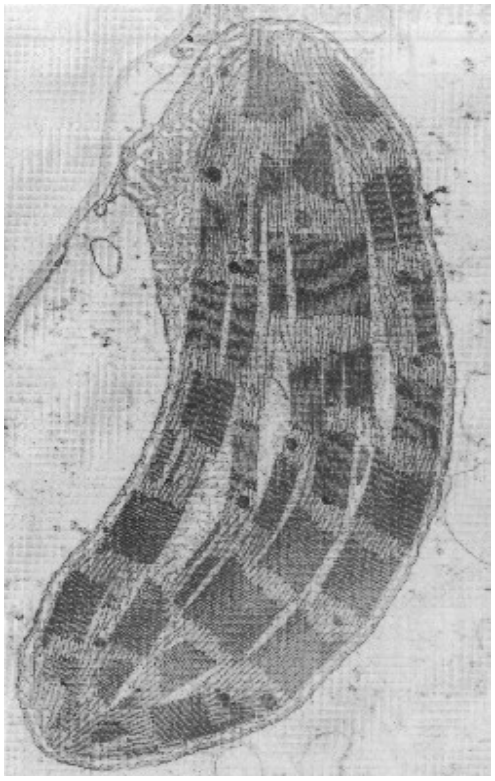
Step four:
rearrange the equation to make actual size the subject:

actual size of image = size of image ÷magnification
= 17000 ÷ 2500
= 6.8 μm

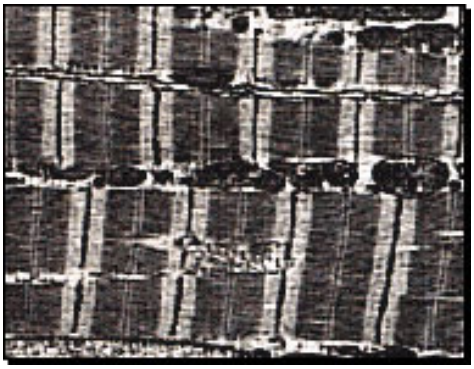
Now try these yourself



Magnification is x100
What is the actual size of one of these epithelial cells?

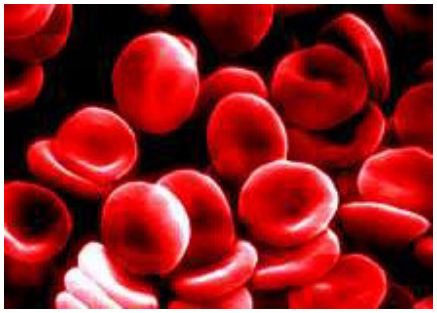


If the actual length of this chloroplast is 10μm, what is the magnification?

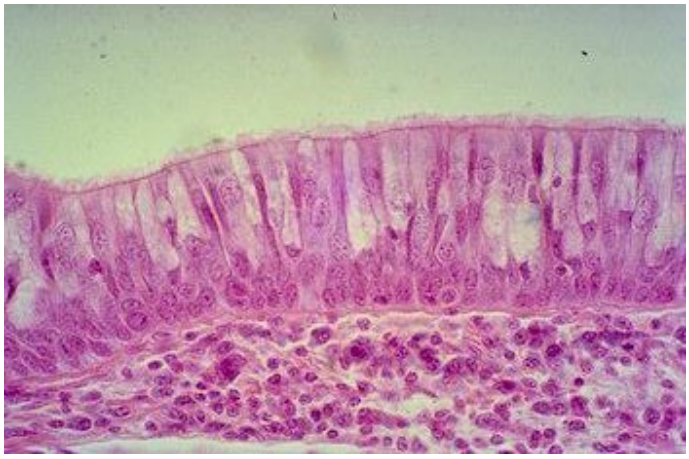


The optic magnification is x60 and the eyepiece magnification is x10, what is the actual length of:

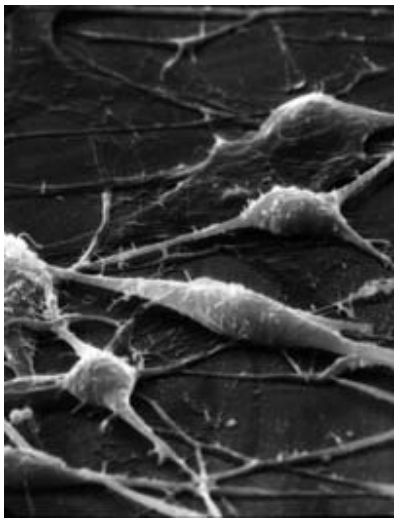
a) the white stripe of the muscle fibre?
b) the dark stripe of the muscle fibre?
c) a mitochondrion?



If the actual diameter of these red blood cells is 30μm, what is the magnification?



The magnification is x500
What is the actual length of the cilia on these ciliated epithelial cells?



These are nerve fibres. Magnification is x750.
Draw a scale diagram of one nerve fibre.