MICROSCOPE CALCULATIONS PRACTICE

TOP MARKS SCIENCE

1) Use the information below to calculate the magnification of a microscope

a) Image = 10cm, Actual = 2cm

b) Image = 15cm, Actual = 3cm

c) Image = 50mm, Actual = 2mm

d) Image = 450mm, Actual = 15mm

e) Image = 3575um , Actual = 5um

f) Image = 7000um, Actual = 500um

g) Actual = 2.5nm, Image = 500nm

h) Image = 4500um, Actual = 5nm

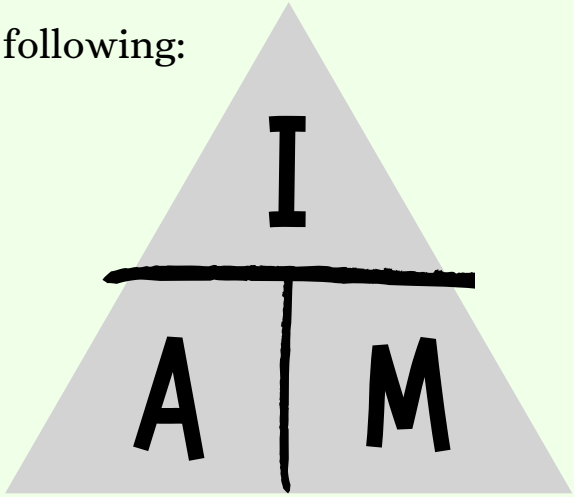
2) Rearrange the equation triangle to calculate the following:

a) Image = 3mm, Magnification = x40

b) Image = 2mm, Magnification = x10

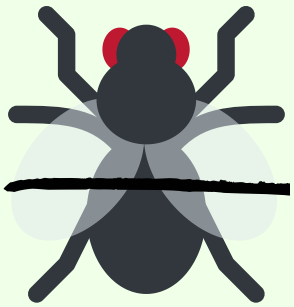
c) Actual = 2mm, Magnification = x20

d) Actual = 5mm, Magnification = x30

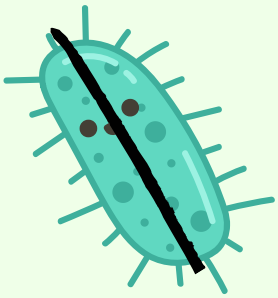


3) Use a ruler to measure the size of each image and use this to calculate the magnification

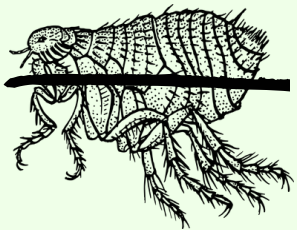
a) Image = _____mm, Actual = 2mm,



b) Image = _____mm, Actual = 2.5mm



c) Image = _____mm, Actual = 0.5mm



5) Now use your conversion chart to convert the following units:

1m= _____cm
1m= _____mm
1m= _____um
1m= _____nm
1m= _____mm
1um= _____nm
1nm= _____um
1um=_____mm

12mm= _____um
15um= _____nm
5nm= _____um
5um= _____mm

6) Use the equations above to calculate:

Image in um

Actual= 3um, Magnification= x40, Image = _____um

Actual in um

Image= 8mm, Magnification= x40, Actual = _____um

Magnification

Image= 10mm, Actual= 50um, Magnification = _____

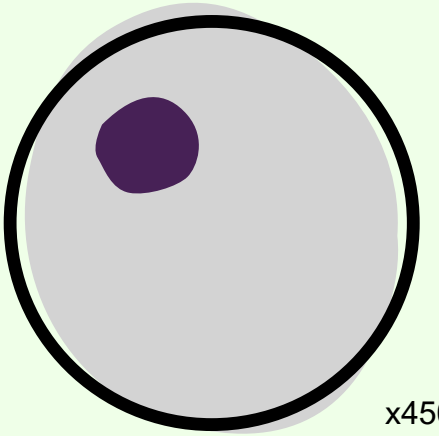
Challenge:
Try and make up your own calculation questions for a partner who has also finished the above. You will need to test your own questions and make sure you can answer them yourself!

Exam style questions

1. A student observes a cell under a microscope.

They see the image which is shown on the right

Calculate the actual diameter of the cell.



x450

_____mm (4)

2. The image of a cell has a diameter of 4.5 millimetres.

The magnification of the image is ×300.

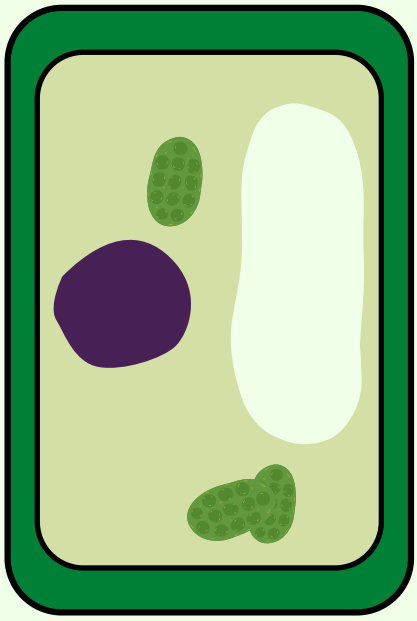
Calculate the diameter of the real cell.

Give your answer in micrometres. (3)

_____um

3. A student observes a cell under a microscope.

Their findings are shown in the image on the right.



The eyepiece was set at a magnification of x10.

The objective was set at x40

ai. Calculate the actual length of the cell.

Give your answer in micrometres. (5)

_____um

ii. Convert your answer from (i) into nanometers (2)

iii. Write your answer from (ii) in standard form. (1)