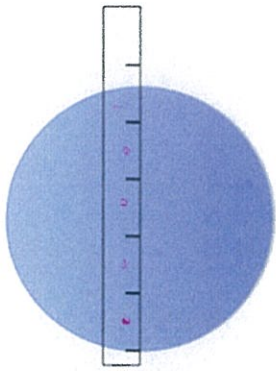


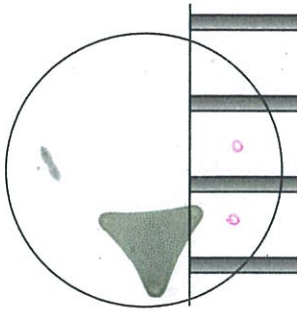
FIELD OF VIEW EXAMPLES

For each of the pictures below calculate the FOV in millimetres and microns:



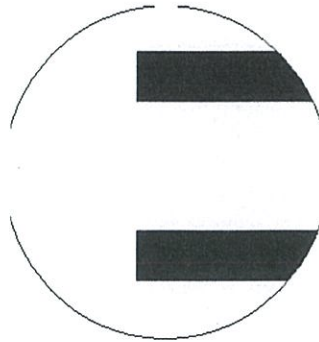
4.5 mm.

$$4.5 \times 1000 = 4500 \mu\text{m}.$$



3 mm.

$$3 \times 1000 = 3000 \mu\text{m}.$$

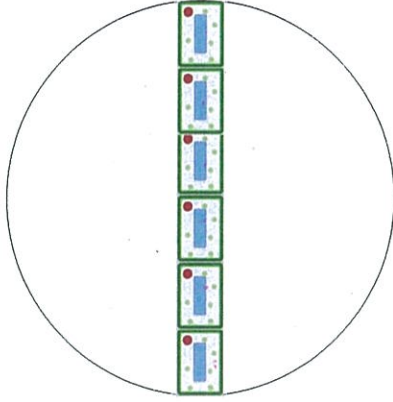


1.5 mm

$$1.5 \times 1000 = 1500 \mu\text{m}.$$

ESTIMATING CELL SIZE

For each of the pictures below estimate the size of the cell:



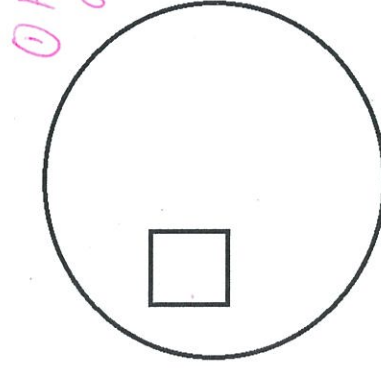
0.9 mm

$$\text{Cell size} = \frac{\text{F.O.V.}}{\# \text{ cells}}$$

$$= \frac{0.9}{6}$$

$$= 0.15 \text{ mm.}$$

or 150 μm .



10 mm

① How many cells would fit across F.O.V.? *use a ruler*

Cell = 1 cm.

F.O.V. = 4.6 cm.

$$\frac{\text{F.O.V.}}{\text{cell size}} = \# \text{ cells}$$

$$= 4.6 \text{ cells across F.O.V.}$$

actual

$$\text{② Cell size} = \frac{\text{F.O.V.}}{\# \text{ of cells.}}$$

$$= \frac{10}{4.6} = 2.17 \text{ mm}$$

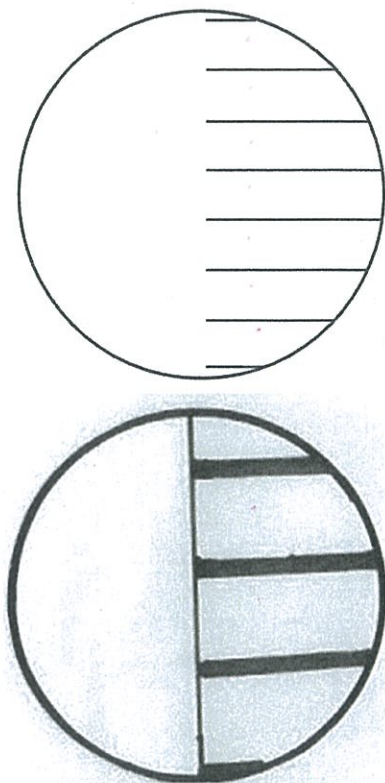
MICROSCOPES CALCULATIONS QUIZ

1. Stacy uses a microscope with an ocular lens that has 10x magnification. When she looks through the microscope, the cells she can see are 400x bigger than in real life. Calculate the magnification of the objective lens: (1 mark)

$$\text{Ocular} \times \text{objective} = \text{Total mag.}$$

$$10 \times ? = 400 \rightarrow \frac{400}{10} = 40 \times \text{mag.}$$

2. Calculate the field of view of the following images in microns. (2 marks)



$$3.5 \mu\text{m} = 3500 \mu\text{m} \quad 7.5 \text{ mm} = 7500 \mu\text{m}$$

3. Peter has doubled his magnification from 50x to 100x. Describe what would happen to the FOV? (You do not need to give a value) (1 mark)

Halve.

4. If the HP magnification is 400x and the diameter of FOV is 2mm, calculate the LP FOV if the microscope is set to a 10x ocular lens and a 10x objective lens. (2 marks)

$$\text{HP Mag} = 400 \times$$

$$\text{HP FOV} = 2 \text{ mm}$$

$$\text{LP Mag} = 10 \times 10 = 100 \times$$

$$\text{LP FOV} = ?$$

$$400 \times 2 = 100 \times ?$$

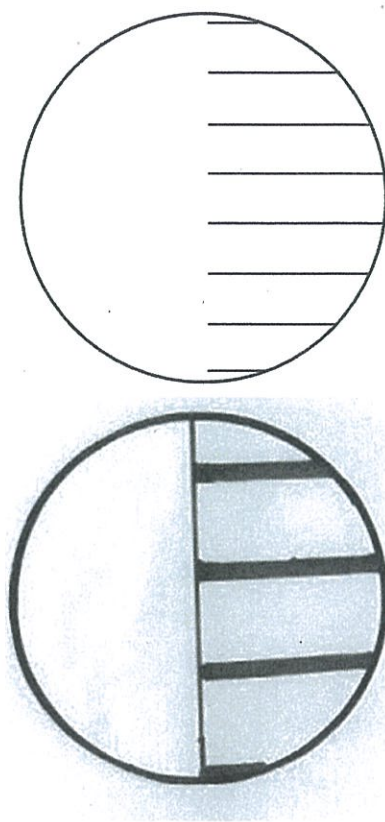
$$\frac{400 \times 2}{100} = 8 \text{ mm}$$

Total: /6

MICROSCOPES CALCULATIONS QUIZ

1. Stacy uses a microscope with an ocular lens that has 10x magnification. When she looks through the microscope, the cells she can see are 400x bigger than in real life. Calculate the magnification of the objective lens: (1 mark)

2. Calculate the field of view of the following images in microns. (2 marks)



3. Peter has doubled his magnification from 50x to 100x. Describe what would happen to the FOV? (You do not need to give a value) (1 mark)

4. If the HP magnification is 400x and the diameter of FOV is 2mm, calculate the LP FOV if the microscope is set to a 10x ocular lens and a 10x objective lens. (2 marks)

Total: /6