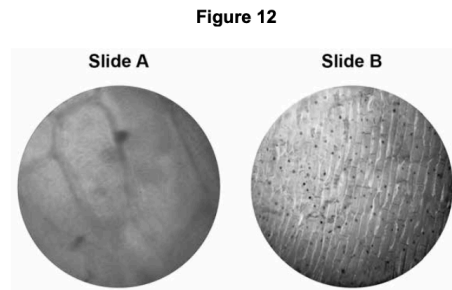


Microscopy (light microscope, required practical)

Q1. (2018)

A student observed slides of onion cells using a microscope.

Figure 12 shows two of the slides the student observed.



The cells on the slides are **not** clear to see.

A)

0 6 . 3

Describe how the student should adjust the microscope to see the cells on **Slide A** more clearly.

[1 mark]

B)

0 6 . 4

Describe how the student should adjust the microscope to see the cells on **Slide B** more clearly.

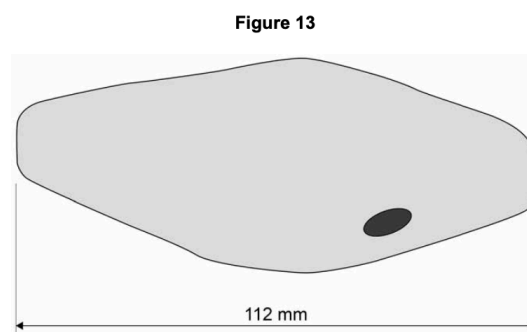
[2 marks]

C)

0 6 . 5

The student made the necessary adjustments to get a clear image.

Figure 13 shows the student's drawing of one of the cells.



The real length of the cell was 280 micrometres (μm).

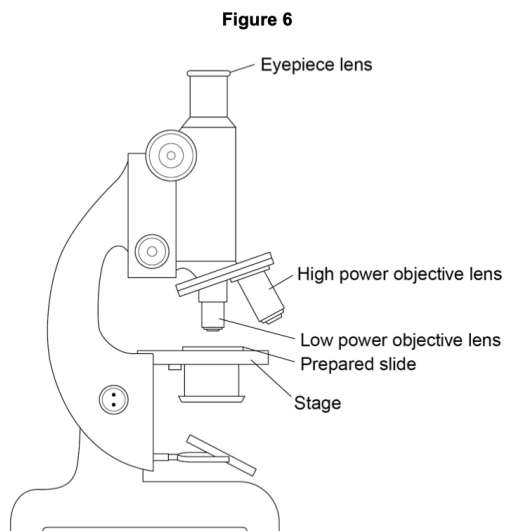
Calculate the magnification of the drawing.

[3 marks]

Magnification = $\times$ _____

Q2. (2019)

Figure 6 shows a microscope.



A)

0 3 . 5 It is easier to view the cells using the low power objective lens first.

Give **one** reason why.

[1 mark]

B)

0 3 . 6 To focus the image the objective lens should be moved away from the stage.

Give **one** reason why the objective lens should **not** be moved towards the stage.

[1 mark]

C)

0 3 . 7 The image of the prepared slide in **Figure 6** is viewed with the $\times 10$ objective lens.

The total magnification is $\times 50$

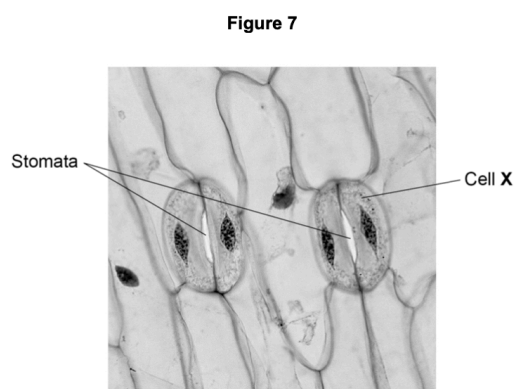
What was the power of the eyepiece lens used?

[1 mark]

 Power of eyepiece lens = $\times$ _____

Q3. (2019)

Figure 7 shows stomata on the lower surface of a leaf.



0 4 . 2 What is the name of cell X?

[1 mark]

Tick (✓) **one** box.

Epidermal cell

☐

Guard cell

☐

Palisade cell

☐

Xylem cell

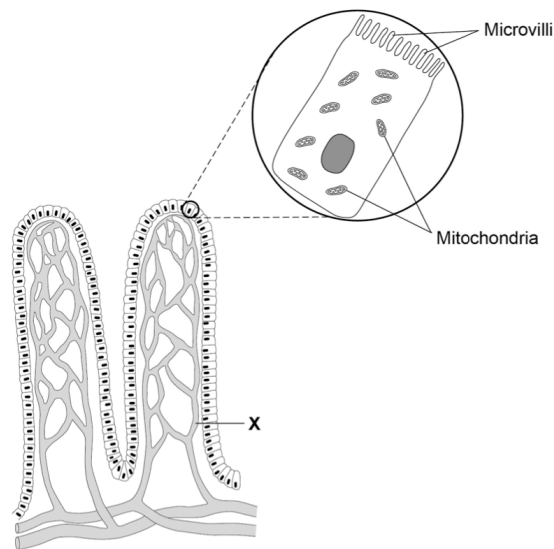
☐

Q4. (2020)

Figure 6 shows two villi.

Figure 6 also shows one cell on the surface of a villus as seen using an electron microscope.

Figure 6



A)

0 6 . 3 Give **one** advantage of using an electron microscope compared with using a light microscope.

[1 mark]

B)

0 6 . 5 The real length of one villus is 0.8 mm

Calculate the image length if the villus is viewed at a magnification of $\times 20$

Use the equation:

$$\text{magnification} = \frac{\text{size of image}}{\text{size of real object}}$$

[3 marks]

Image length = _____ mm

Q5. (2021)

0 1 . 6 One muscle cell was 0.05 mm wide.

When viewed using a microscope the image of the muscle cell was 2 mm wide.

Calculate the magnification used to view the cell.

Use the equation:

$$\text{magnification} = \frac{\text{width of image}}{\text{width of real cell}}$$

[2 marks]

Magnification = × _____

Q6. (2022)

0 2 . 3 A student viewed a section of a leaf using a microscope.

The student measured the length of one of the palisade cells.

The cell image measured 28 mm in length when viewed at a magnification of ×400

Calculate the real length of the palisade cell in millimetres (mm).

Use the equation:

$$\text{real length} = \frac{\text{image length}}{\text{magnification}}$$

[3 marks]

Real length = _____ mm

Convert the real length of the cell from millimetres to micrometres (µm).

1 mm = 1000 µm

Real length = _____ µm

Q7. (2023)

0 7 **Figure 10** shows onion cells viewed using a light microscope.

Figure 10

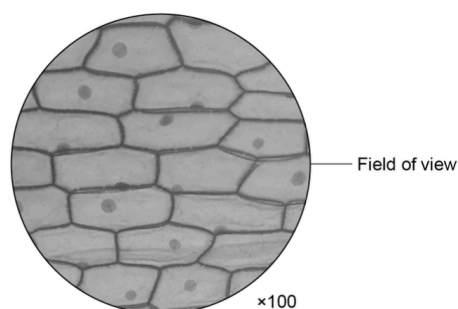
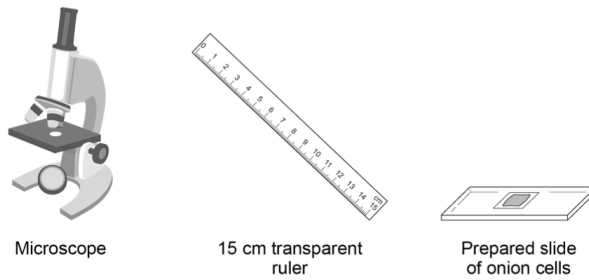


Figure 11 shows the apparatus given to a student.

Figure 11



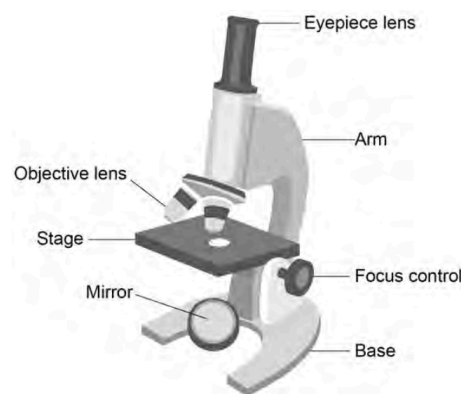
Describe how the student could use the apparatus to estimate the **mean** length of onion cells on the slide.

[6 marks]

Q8. (2024)

0 1 . 4 Figure 2 shows a light microscope.

Figure 2



A student is given a prepared slide of animal cells to view using the microscope.

Complete the sentences.

Use labels from **Figure 2**.

[4 marks]

Place the slide on the _____.

Use the objective lens that has low power.

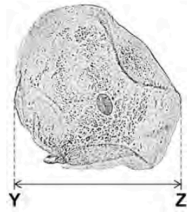
Look through the _____.

Direct the light by moving the _____.

Make the image larger by using the high power _____.

Q9. (2024)

0	1	5
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Figure 3 shows a different animal cell.**Figure 3**

Calculate the magnification of the image in **Figure 3**.

Complete the following steps.

[4 marks]

Measure the width of the image from **Y** to **Z**, in millimetres (mm).

Width of image = _____ mm

Give the width of the image in micrometres (μm).

1 mm = 1000 μm

Width of image = _____ μm

The cell in **Figure 3** has a real width of 40 micrometres (μm).

Use the equation to calculate the magnification.

$$\text{magnification} = \frac{\text{width of image in } \mu\text{m}}{\text{real width of cell in } \mu\text{m}}$$

Magnification = $\times$ _____