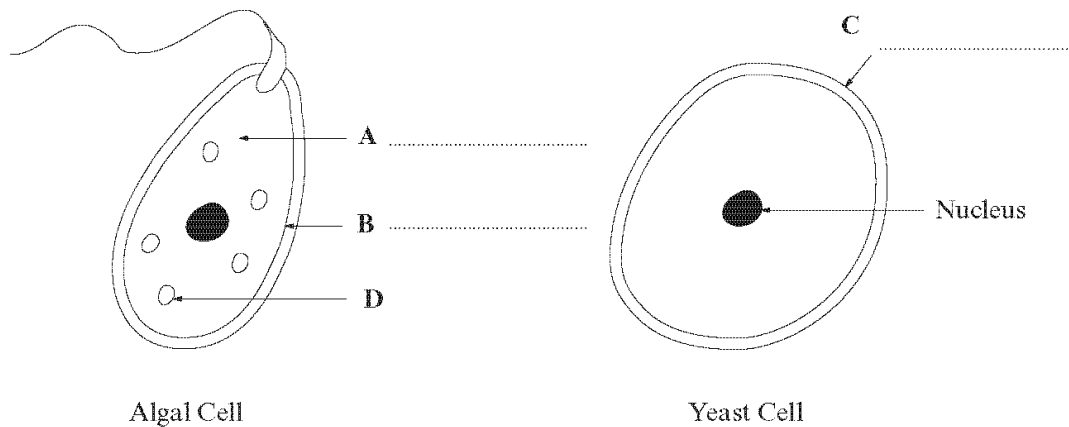


# Cognitio - Cells Overview Paper

**1.***(a)* The diagrams below show two micro-organisms.*(i)* Label **A**, **B** and **C** on the diagrams below.

[3]

*(ii)* Structure **D** contains chlorophyll. Name this structure and state its function. [2]

Name .....

Function .....

*(iii)* Name **one** structure shown on the diagrams above, which would *not* be present in a bacterial cell. [1]

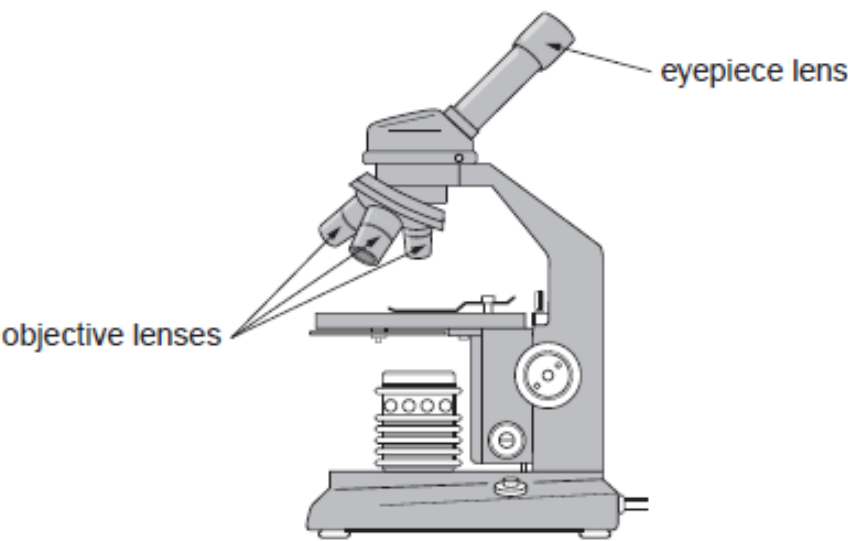
.....

*(b)* Scientists use light microscopes to study living cells. Why is an electron microscope *unsuitable* for this task? [1]

.....

7

2. 2. Rheinallt observed some plant cells using a light microscope.



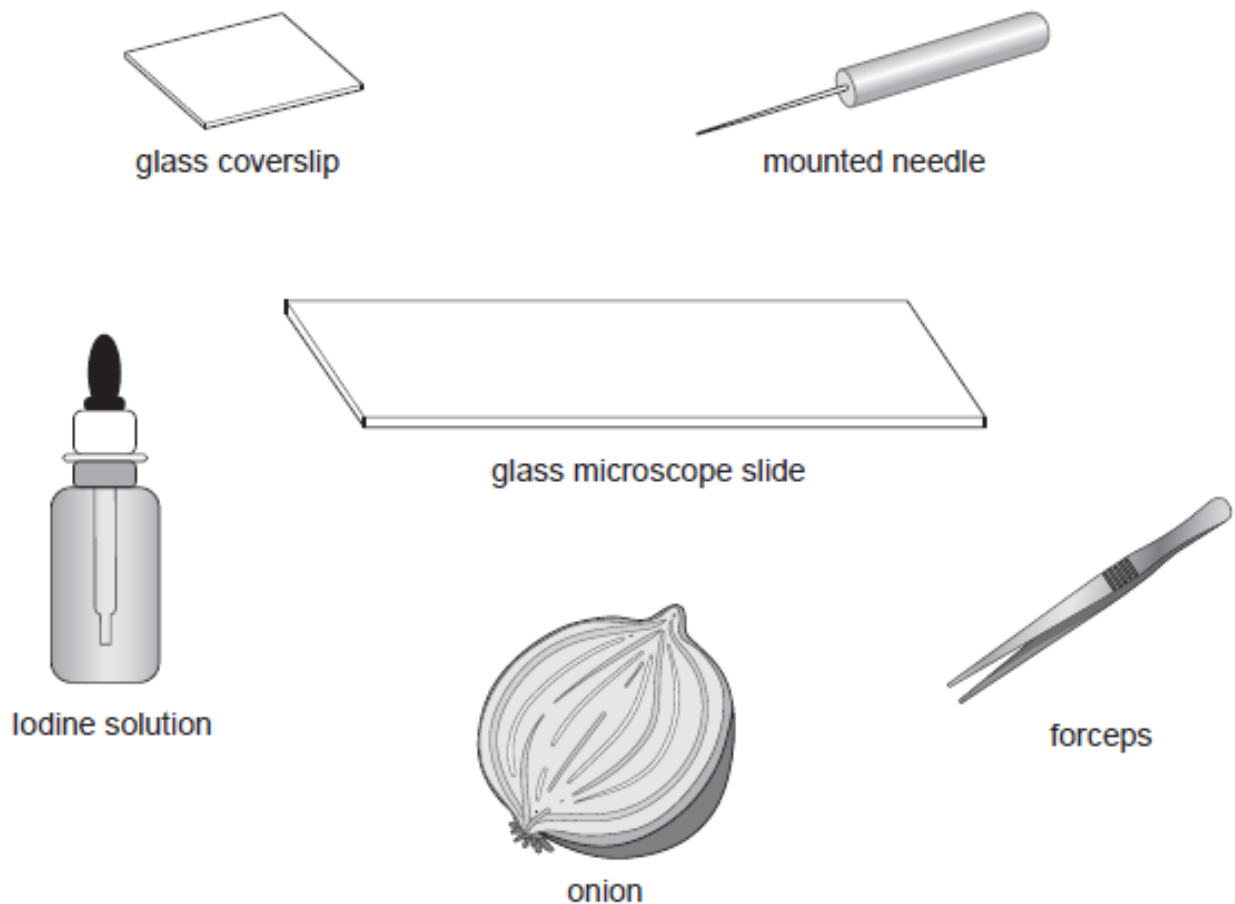
(a) He set up the microscope so that it had a total magnification of  $\times 240$ .

The magnification of the eyepiece lens on his microscope was  $\times 6$ . Which of the following objective lenses did he use? [1]

Objective lens power	Magnification
low	$\times 8$
medium	$\times 15$
high	$\times 40$

Objective lens magnification =  $\times$  .....

(b) The diagram shows the apparatus Rheinallt used to prepare a slide of onion cells.

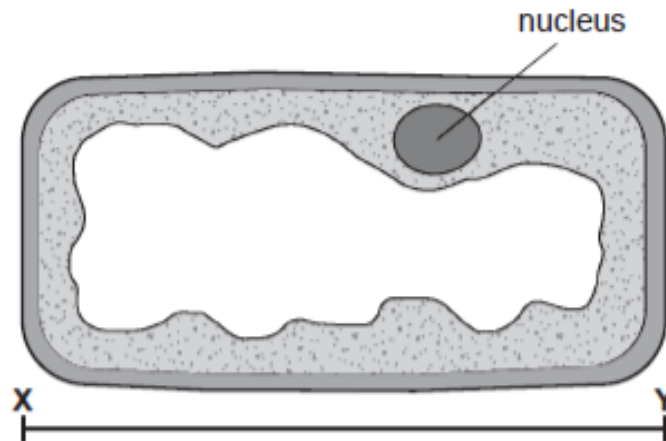


Continue and complete the method below, which he used to prepare his slide for observation under the microscope. [3]

*Method*

- Take a piece of freshly cut onion.
- Use forceps to carefully peel a thin layer of cells from the inner surface of the onion.
- Place the layer of onion cells onto the centre of a microscope slide.
- .....
- .....
- .....

(c) Rheinallt made a large drawing of one of the cells he observed.



- (i) I. Measure the length of the cell in Rheinallt's drawing along line X–Y. [1]

Length of cell in drawing = ..... mm

- II. The actual length of cells of this type is usually 0.02 mm.  
Use your answer to part I. to calculate the magnification of Rheinallt's drawing. [2]

Magnification of drawing =  $\times$  .....

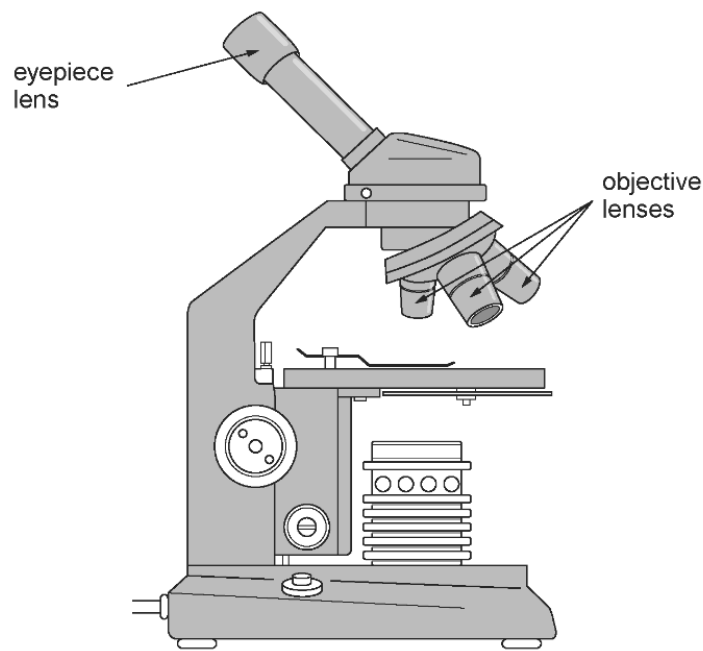
- (ii) From the drawing, give **one** feature of the cell which shows that it is a plant cell. [1]

.....

- (d) Rheinallt compared his drawing with an image obtained from an electron microscope. Why would the electron microscope image give more information about the structure of an onion cell? [1]

.....

3. Rhys studies some plant tissue using the instrument shown below.



(a) State the name of the instrument shown in the diagram. [1]

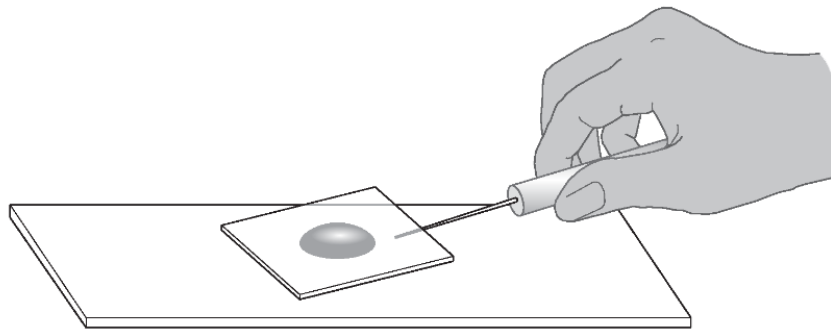
(b) The table shows the magnification of each of the four lenses.

Lens	Magnification
eyepiece lens	×10
low power objective lens	×4
medium power objective lens	×10
high power objective lens	×40

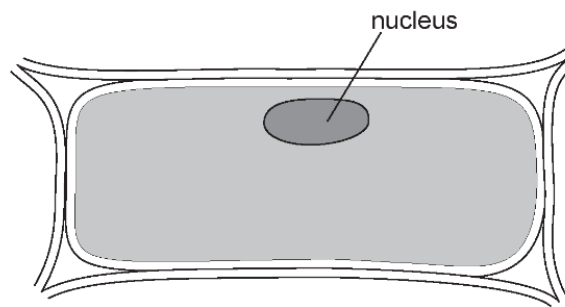
Calculate the maximum magnification that is possible with this instrument. [2]

maximum magnification = × .....

Rhys places some of the plant tissue in water on a slide and lowers a cover slip on top as shown below.



He draws one cell from the tissue as seen under the maximum magnification. His drawing is shown below.



- (c) State what Rhys could have done to the plant tissue to show more detail of the cell structures. [1]

.....

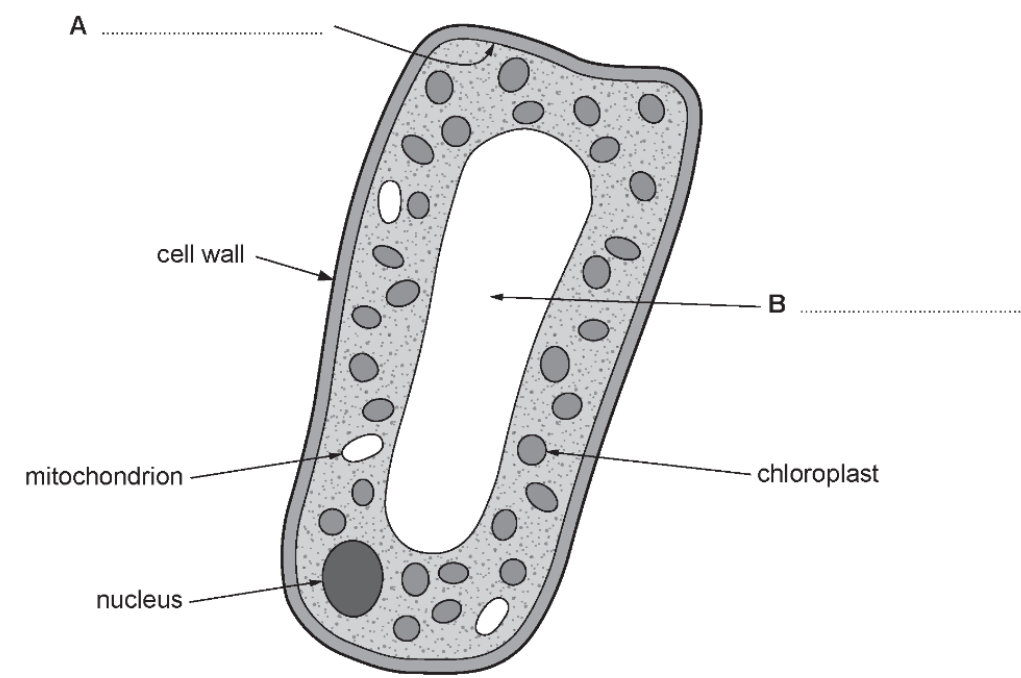
- (d) State the function of the nucleus. [1]

.....

.....

4.

The diagram below shows a section through a plant cell as seen with a light microscope.



- (a)

(i)

Label parts **A** and **B** on the diagram.

[2]
- (ii)

Complete the table below.

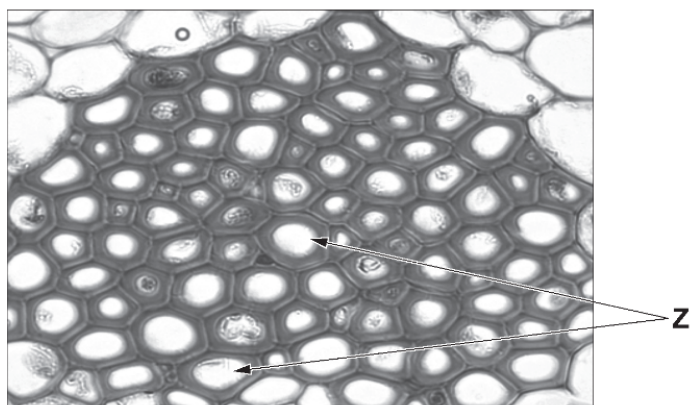
[3]

Part of cell	Function	Cell part present (✓) or absent (×) in animal cell
.....	photosynthesis	.....
mitochondrion	.....	✓
.....	contains the chromosomes	.....



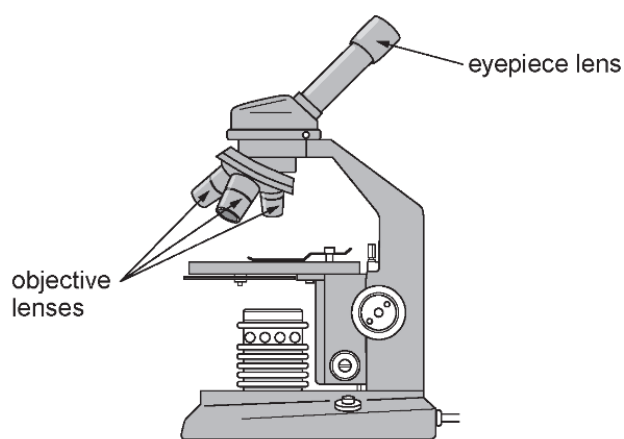
- (b) The photograph below shows some plant cells as seen under a light microscope.

The group of cells labelled Z has been treated using a procedure to make their cell walls more clearly visible.



- (i) What was the procedure carried out on these plant cells while they were prepared for viewing under the microscope? [1]

- (ii) When the microscope was used to view these plant cells the magnification of the eyepiece lens was  $\times 10$  and the magnification of the objective lens used was  $\times 10$ .



Using this information, calculate the total magnification of the image.

[1]

Magnification =  $\times$  .....

Turn over.

7