



# AQA Biology

## Required Practical 1: Microscopy

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**Aim:** To use a light microscope to observe, draw and label biological specimens.

## Equipment List:

- small piece of onion
- light microscope
- microscope slide
- pipette
- forceps
- iodine solution
- coverslip
- pointed needle
- blotting paper
- eyepiece graticule/transparent ruler

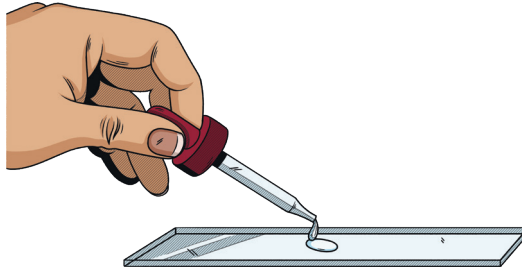
## Risk Assessment:

Hazard	Risk	Emergency Procedure
iodine solution	ingestion or staining	Wear goggles always when preparing the slide and inform teacher of spills. Wash hands before removing goggles.
water spills	slips and falls	Inform teacher and mop up spills immediately.
pointed needle	piercing skin	Wipe area with an antiseptic wipe and apply plaster (check for allergy).
broken glass from slides and coverslips	cuts	Inform teacher and discard any broken glass in sharps disposal container. Apply pressure to wounds and seek first aid.

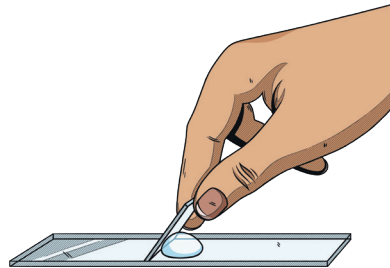
## Preparing a Microscope Slide

### Method:

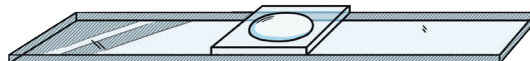
1. Using the pipette, add a drop of water to the microscope slide.



2. Carefully peel off a thin piece of epidermal tissue from the inside of the onion.
3. Place the tissue on the microscope slide, making sure it is as flat as possible.
4. Add a drop of iodine to the onion tissue.
5. Carefully use the pointed needle (if required) to lower the cover slip onto the slide, ensuring there are no air bubbles.



6. Use the blotting paper to absorb any excess water or iodine solution.



## Using the Light Microscope

Method:

1. Plug in the microscope and turn on the light. If your microscope has a mirror, you may need to adjust it so light is directed through the diaphragm.
2. Place your prepared slide on the stage and secure it with the stage clips.
3. Turn the objective lens to the lowest magnification (usually  $\times 4$ ).
4. Turn the coarse adjustment knob until the objective lens is almost touching the microscope slide. Look from the side of the microscope as you do this, not through the eyepiece, so you do not damage the slide.
5. Looking through the eyepiece, turn the coarse adjustment knob to move the stage away from the objective lens until the cells come into focus.
6. Use the fine adjustment knob to bring the cells into clear focus.
7. Turn to a higher power objective lens ( $\times 10$  or  $\times 40$ ) and refocus the slide using the fine adjustment knob.
8. Draw and label a diagram of the cells. Include a scale bar and magnification. Magnification is calculated by multiplying the eyepiece lens magnification by the objective lens magnification.

Diagram

0 1

Some students are carrying out a practical activity using microscopes.

0 1 . 1

Which piece of equipment is **not** required when preparing a specimen for observation under a light microscope?

Tick **one** box.

[1 mark]

☐

coverslip

☐

microscope slide

☐

pointed needle

☐

thermometer

0 1 . 2

Write down **two** possible hazards when carrying out a practical activity to prepare and observe a specimen under a light microscope and explain how the risk of each hazard can be prevented.

[2 marks]

Hazard \_\_\_\_\_

Prevention \_\_\_\_\_

\_\_\_\_\_

Hazard \_\_\_\_\_

Prevention \_\_\_\_\_

\_\_\_\_\_

3

0 2

An onion cell is viewed using a light microscope at  $\times 400$  magnification. The size of the image is measured as 14.8mm.

0 2 . 1

Write down the equation that links magnification, size of image and size of real object.

[1 mark]

\_\_\_\_\_

0 2 . 2

Calculate the real size of the cell in mm.

[2 marks]

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

real size = \_\_\_\_\_mm

0 2 . 3

Convert your answer to **02.2** to  $\mu\text{m}$ .

[1 mark]

real size = \_\_\_\_\_mm

4

