

WJEC Wales Biology A Level

S.P 1.2: Preparation and scientific drawing of a slide of onion cells

Practical notes



Introduction

A **wet mount** is commonly used to create **temporary preparations** of plant tissues and to view aquatic organisms under a **light microscope**. This increases the **magnification** and **resolution** of the image, allowing the specimen to be observed more clearly. Onion cell samples can be prepared and observed in this way.

Equipment

- Light microscope
- Eyepiece graticule
- Stage micrometer
- Microscope slide
- Coverslip
- Scalpel
- Mounted needle
- Forceps
- 2× pipette
- Paper towel
- Iodine solution
- Onion

Risk assessment

Hazard	Risk	Precaution	Emergency
Broken glass	Cuts	Keep glassware away from the edge of the desk; handle microscope slides carefully	Dispose of broken glassware carefully; elevate cuts and apply pressure; do not remove glass from cuts; seek medical assistance
Scalpel	Cuts	Direction of cut away from the body; do not attempt to change blade; keep scalpel away from the edge of the desk	Elevate cuts and apply pressure; wash minor cuts in cold water; seek medical assistance
Iodine solution	Harmful in contact with skin	Wear gloves	Remove contaminated clothing; run the affected area under cold water
	Harmful to eyes	Wear safety goggles	Flood eye(s) with tap water; seek medical assistance



Method

Preparing the microscope slide

1. Use a pipette to place a **droplet of water** onto a microscope slide
2. Take a piece of onion and using **forceps**, remove the thin inner membrane
3. Cut a suitably sized piece of membrane using a **scalpel**
4. Use the forceps to gently place the piece of membrane into the water droplet
5. Add a few drops of **iodine solution** onto the membrane using a pipette
6. Use a **mounted needle** to lower the coverslip over the specimen. *Lower at an angle to prevent the formation of air bubbles.*
7. Use a paper towel to absorb any excess water on the microscope slide

Observing the microscope slide

1. Place the slide under the clips on the microscope stage
2. Turn the **lowest power objective lens** on the nose piece
3. Turn the **coarse adjustment knob** to move the stage close to the lens. *Ensure that the lens does not touch the stage*
4. Look down the microscope and turn the **coarse adjustment knob** to **focus** the image
5. Turn the **fine adjustment knob** until the clearest image is obtained
6. Rotate to the medium power objective lens and focus using the **fine adjustment knob**.
7. Repeat for the high power objective lens
8. Make an annotated high-power plan drawing of the specimen (a few cells)
9. Calculate the actual size of an onion cell (by **calibrating** the microscope)
10. Calculate the **magnification** of the drawing (see below)



Tips for high-power plan drawings

- Drawing should fill at least half of the provided space
- Only draw what you can see
- Use a **sharp pencil**
- Ensure lines are **single, complete** and **non-overlapping**
- Do **not** use shading or colour
- Create **straight lines** for labels using a ruler
- Lines should **not** intersect
- Label lines should **not** have arrow heads
- Include a scale in terms of **eyepiece units**
- Include a title and objective lens power
- Include a **magnification**

Magnification of drawings

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

