

Edexcel IAL Biology A Level

Core Practical 7

Use a light microscope to make observations, draw and label plan diagrams of transverse sections of roots, stems and leaves

Use a light microscope to make observations, draw and label cells of plant tissues

Use a light microscope to identify sclerenchyma fibres, phloem, sieve tubes and xylem vessels and their location



Equipment list

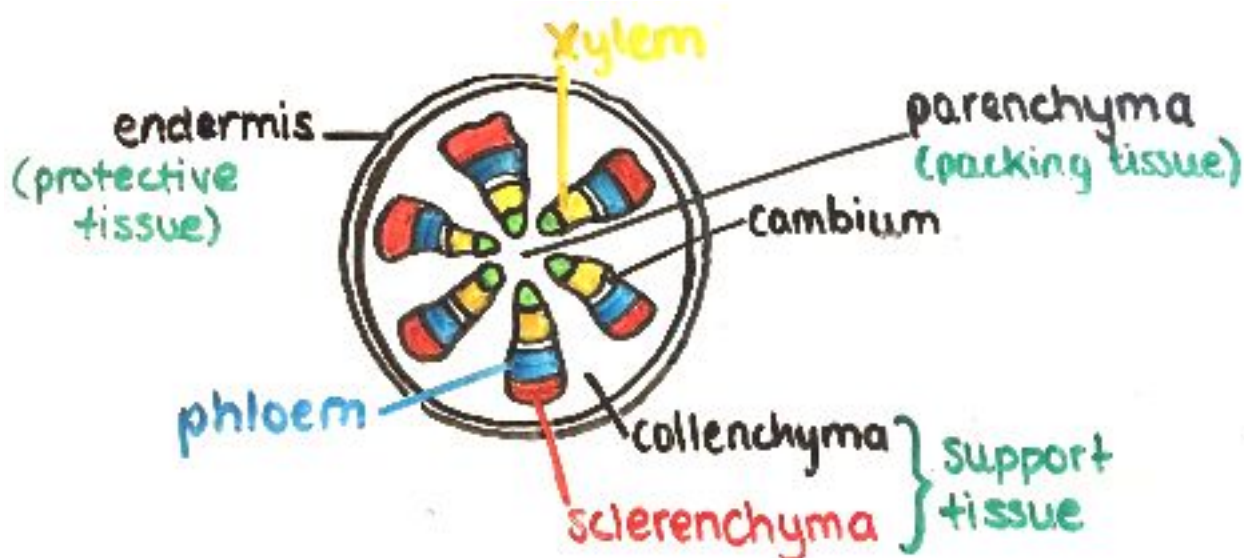
- Large leaf
- Root
- Plant stem
- Light microscope
- Microscopic slides
- Cover slips
- Distilled water
- Pipette
- Toluidine blue O stain
- Razor
- White tile
- Tweezers
- Paper towel

Method

1. Take the plant stem and place it on a white tile and fill a petri dish with a **shallow level** of distilled water.
2. Lightly run the razor edge down the length of the stem several times to give **several thin specimens**, using tweezers to place them in the petri dish. Select the **thinnest** specimen and place it on a microscopic slide.
3. Use a paper towel to dab the edges of the specimen to **absorb any excess water**.
4. Put on the eye protection and gloves and use a pipette to add 2-3 drops of the stain to the specimen. Leave it to soak in for 3 minutes and then again use a paper towel to **absorb any excess liquid**.
5. Lay the coverslip onto the slide, pressing firmly to **thin the specimen** and **remove any air bubbles** between the coverslip and the slide.
6. Observe the specimen under the light microscope:
 - Rotate the revolving nosepiece to line up the **lowest power** objective lens.
 - Look through the eyepiece and use the **coarse adjustment knob** to lower and raise the stage until an image comes into focus.
 - Then use the **fine adjustment knob** to focus the image further.
 - Produce a biological drawing using either the **low or medium objective lens**. Repeat steps 1-6 using the root section leaf.



7. Use the figure below to identify the different plant tissues in the stem.



Risk assessment

Risk	Hazard	Precaution
Toluidine blue O stain	Could cause an allergic reaction, may irritate the skin if contact occurs	Use eye protection and disposable gloves when handling If it comes into contact with skin then rinse with cold, running water
Stem, root and leaf	Could cause an allergic reaction	Minimise contact, wear gloves if an allergy is present
Razor	Cuts from sharp objects	Take care when using; keep away from the edge of the desk Carry it on a white tile when moving around the lab Keep away from edge of desk
Microscope	Heavy object	Do not use on the edge of the desk as it could be knocked onto body parts such as the feet



Biological drawings

When producing biological drawings, in this case of cells being observed under the microscope, certain rules should be followed:

- Draw in pencil only
- Use blank white paper
- Do not sketch - draw clear, unfeathered lines only
- Include labels
- Label lines should be drawn with a ruler and not cross over each other
- Do not shade the drawing
- Include the magnification of the microscope in the title
- Make diagrams as simple as possible and draw them an appropriate size so everything can clearly be seen
- Include a scale bar where possible

