

Introduction

This practical introduces pupils to some of the skills needed for the preparation of slides for observation under a microscope. The thin membrane from between the layers of a raw onion provides a good material for viewing plant cells. Preparation of a thin section is quite straightforward and the cells in the onion 'skin' (or membrane) are readily visible.

Apparatus

Each pupil will need:

Microscope slide and cover slip

Tweezers

Microscope (one per pair of pupils)

Materials/chemicals

Small slice of raw onion (approximately 1-2 cm x 1 cm)

▲ Teachers may prefer to provide pupils with the small pieces of onion rather than the pupils cutting slices of onions themselves.

i It is sometimes easier to see the cell structures if red onions are used. Alternatively, CLEAPSS suggests using very thin slices of raw beetroot.

Distilled water

Plastic dropper pipette

Absorbent paper towel e.g. kitchen roll

Iodine solution, 0.01 mol dm⁻³, in a dropper bottle

i At this concentration, iodine solution is LOW HAZARD but can stain skin and clothing and may irritate eyes. To make the solution, see the CLEAPSS Recipe Card for iodine solution.

What to do

1. Using the tweezers, peel off the thin membrane from the inside (rough side) of a small piece of onion (about 0.5 cm²).

2. Lay the membrane flat on a clean microscope slide.

3. Add one drop of water to the onion membrane.

4. Slowly lower the coverslip over the onion membrane.

i Some pupils find it easier to handle the coverslip with tweezers. Care will be needed to avoid trapping any air bubbles.

5. Hold the edge of a small piece of torn paper towel next to the coverslip. This will draw out excess water (and trapped air bubbles).

6. Place the prepared slide on the microscope stage. Use the clips to hold it in place.

7. Observe the onion cells using the lowest power magnification of the microscope to start with.

i Pupils should be able to observe that the cells are arranged rather like the bricks in a wall.

8. Ensure the cells are in focus before increasing the magnification and then refocusing. At higher magnification it should be possible to make out the nuclei in some of the cells.

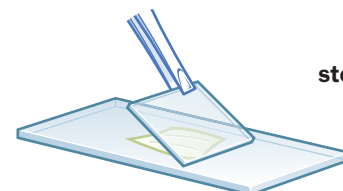
step 1



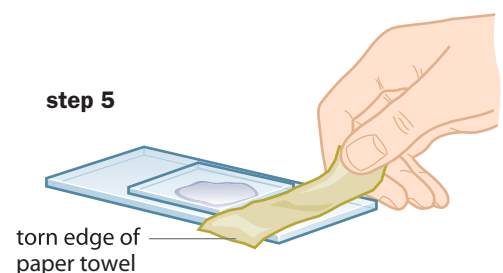
step 2-3



step 4



step 5



9. The procedure can be repeated using a drop of iodine solution instead of water in Step 3. This should make it easier to pick out the basic cell structures. It is worth pointing out that the pupils will not be able to see any chloroplasts in the onion cells.

10. Clear away and wash hands.
⚠ *Teachers should consider a safe way for all the used slides and coverslips to be collected.*
