Chapter 7 - The Cell

Activity 6 To be familiar with and to use a light microscope

Examine a range of prepared slides as follows:

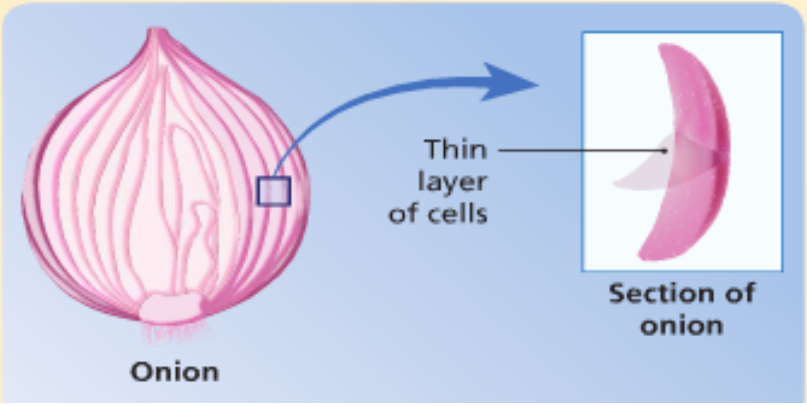
1. Make sure that the lenses are clean.
2. Lower the microscope stage as far as it will go.
3. Click the low-power objective lens into place.
4. Place a microscope slide on the stage. Ensure that the object to be viewed is in the centre of the opening in the stage.
5. Clip the slide into position.
6. View the stage from the side and use the coarse adjustment knob to move the low-power objective lens down so that it is just above the slide.
7. View the object through the microscope.
8. Adjust the coarse adjustment knob to move the stage down until the object is in focus. (Steps 6–8 prevent the slide from being damaged by the objective lens.)
9. Adjust the amount of light so that the object can be seen most clearly (this often involves reducing the amount of light). Depending on the type of microscope being used this may involve one or more of the following procedures:
   - Adjusting the condenser to focus light on the object
   - Adjusting the diaphragm to control the amount of light reaching the object
   - Adjusting the angle of the mirror
   - Using the concave side of the mirror
   - Placing a sheet of paper between the bulb and the microscope to cause the light to be diffused.
10. When the object is focused under low power, move the slide so that the part of the object you wish to view is in the centre of what you can see (called your field of view).
11. Click the high-power objective lens into place.
12. The object should be almost in focus. If it is not, use the fine adjustment knob to focus it correctly. Be careful not to move the objective lens too close to the slide (as this would crack the slide).

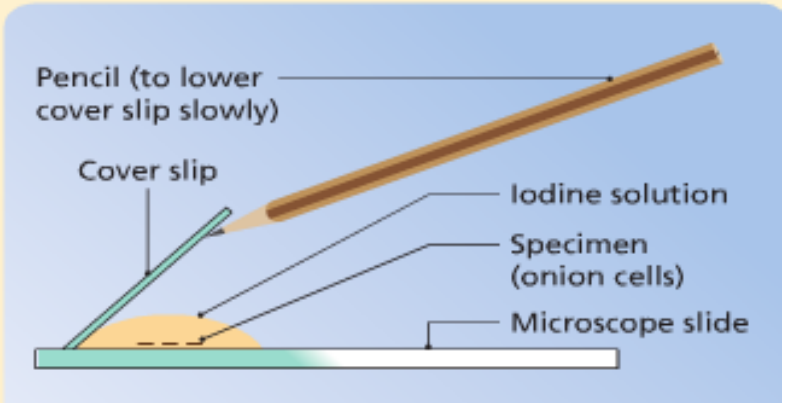
A Prepare the slide

1. Remove the outer, dry scaly leaves of an onion.
2. Use a forceps or your fingers to pull a strip of thin, transparent epidermis from the inner curve of a fleshy, inner leaf.
3. Place a small piece of the epidermal strip on a microscope slide.
4. Add a few drops of iodine solution. (This is a red-yellow stain. It stains the nucleus orange and the cytoplasm yellow. A mixture of potassium iodide and iodine gives a better result.)
5. Add a cover slip (this prevents the cells from drying out and prevents the lens from getting stained). Lower the cover slip at an angle (this eliminates air bubbles).
6. Blot off any surplus iodine, if necessary.
7. The cells can be viewed unstained by using a few drops of water instead of iodine solution at step 4 above.

B Examine under the microscope

1. The slide can be examined under the microscope in the same way as described in Activity 6.
2. The results will appear similar to those shown in diagram 7.18.
3. Draw diagrams of what you can see at low power and at high power.



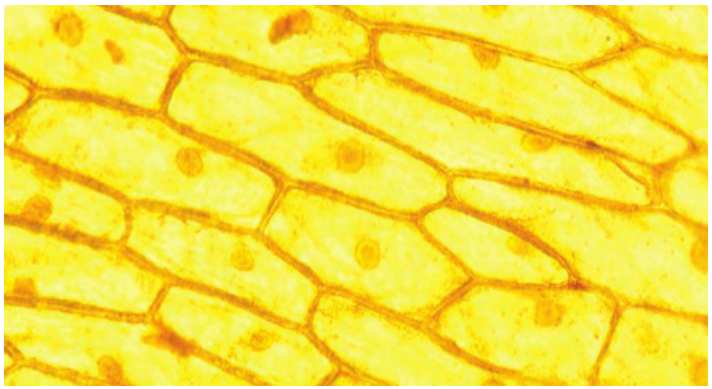


A Prepare the slide

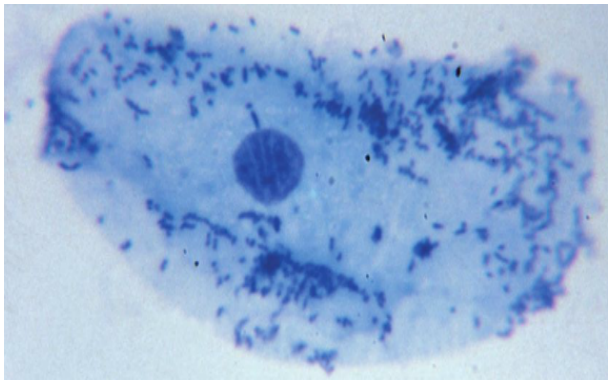
1. Rinse your mouth out with water.
2. Scrape the inside of your mouth with a lollipop stick or a cotton wool bud (this will collect many cheek cells).
3. Spread the smear of cells thinly onto a glass slide.
4. Add a few drops of methylene blue (this stains the nucleus dark blue and the cytoplasm pale blue) and leave for a few minutes.
5. Add a cover slip at an angle (to eliminate air bubbles).
6. Blot off excess stain, if necessary.
7. The cells can be viewed unstained by using water instead of methylene blue at step 4.

B Examine under the microscope

1. The slide can be examined under the microscope in the same way as described in Activity 6.
2. The result will appear as shown in diagram 7.21.
3. Draw diagrams of the cells at low power and at high power.



Onion Cell with Iodine



Human Cheek Cell with Methylene Blue