Preparation and scientific drawing of a slide of onion cells including calibration of actual size and magnification of drawing

Specification reference:

AS Component: 1.2 **A level Component: Core concepts 2**

Cell structure and organisation

Introduction

An onion is made up of swollen leaf bases separated by thin membranes of cells. In this exercise you will make a wet mount on a microscope slide, look at the cells using each objective lens and identify the features of the cell visible under the light microscope. Using a calibrated eye piece graticule you will calculate the size of a cell and draw a group of at least three cells in the correct proportion. You should calculate the magnification of your drawing.

Apparatus

Microscope fitted with an eye piece graticule
Microscope slide and cover slip
Onion
Paper towel
Scalpel
White tile
Mounted needle
Iodine solution
Forceps

Method

1. Place two drops of water onto a microscope slide.
2. Take a small piece of onion and using forceps peel off the membrane from the underside (the rough side).
3. Lay a piece of the membrane flat on the surface of the slide taking care that it is a single layer and not folded back on itself.
4. Add three drops of iodine solution.
5. Place one edge of a coverslip onto the slide and lower it gently using a mounted needle, making sure that there are no air bubbles.
6. Gently press the coverslip down using a piece of paper towel.
7. Using the x4 objective position the slide and focus on the section.
8. Swing the x10 objective into place and move the slide carefully until a clear area of cells are observed i.e. no large bubbles, no folds and a single layer of cells.
9. Draw a group of at least three cells in the correct proportion. Indicate the length of one cell in eye piece units on the drawing.

10. You should use the x40 objective to help you identify and label structures in the cells.
11. Calculate the actual size of one of your cells and the magnification of your drawing.

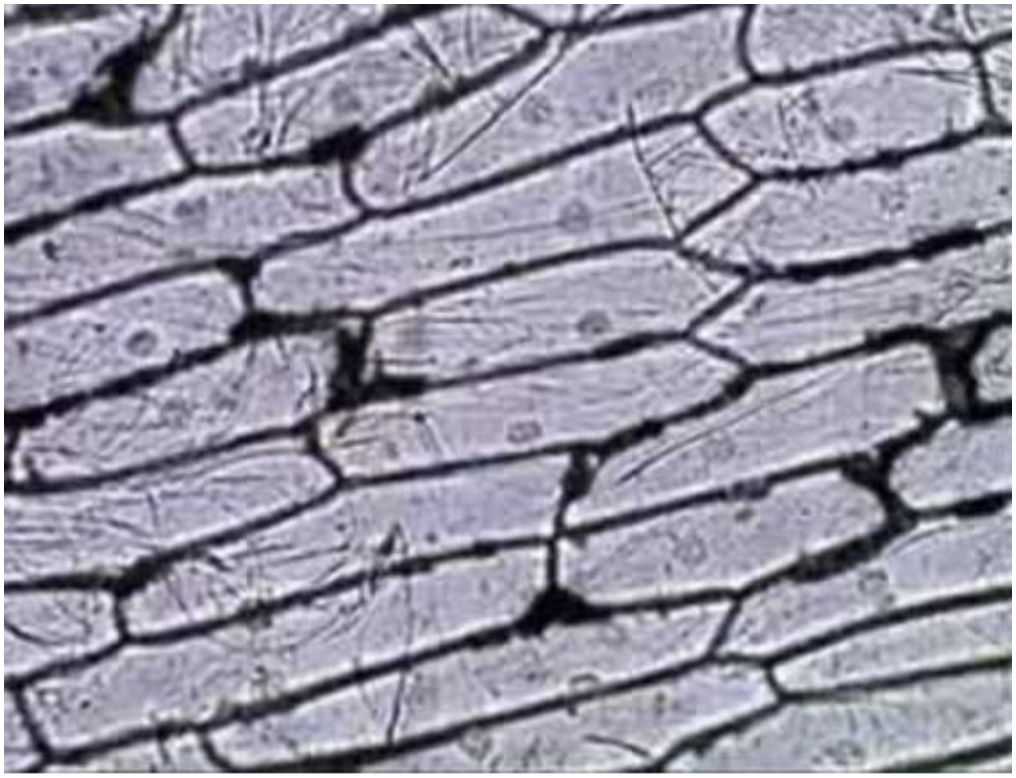
Risk Assessment

Hazard	Risk	Control measure
Scalpel blade is sharp	could cut skin when cutting onion	Cut away from body onto a white tile.
Iodine in potassium iodide solution is an irritant	Could be transferred from skin to eyes	Wear safety glasses
Broken glass is sharp	Cover slips could shatter and cut skin	Place a paper towel over the coverslip before pressing down onto it.

Teacher/ Technicians notes

Iodine is only sparingly soluble in water (0.3 g per litre); it is usual to dissolve it in potassium iodide solution (KI) to make a 0.01 M solution (by tenfold dilution of a 0.1 M solution). Refer to CLEAPSS Recipe card 33

Red onions or rhubarb epidermis will give a clearer definition of the cytoplasm.



See guidance notes in the Lab book with regard to quality of drawing, calculation of actual size and magnification.

Further work

- Observation of *Amoeba*
- Observation of alga

Practical techniques

- use of light microscope at high power and low power, including use of a graticule
- produce scientific drawing from observation with annotations