

OCR (B) Biology A-level

Module 1: Development of practical skills in Biology

PAG 8: Transport In and Out of Cells

Please note: You only need to do one from each PAG, and you don't need to do the PAGs listed here, as long as you show the same skills that these are testing (see 5f of the specification for more information). However, you need to at least be able to design your own method for most of these experiments in the exam.



Investigating cell membrane permeability – the effect of temperature on beetroot cell membranes:

1. Use a scalpel to cut five equal sizes of beetroot. Rinse the pieces to remove any pigment released during cutting.
2. Add the 5 pieces to 5 different test tubes, each containing 5 cm³ of water.
3. Place each test tube of in a water bath at different temperatures for the same length of time using a stopwatch.
4. Remove the pieces of beetroot, leaving just the liquid.
5. Carry out colorimetry (use the blue filter).
6. **The higher the permeability, the more pigment released, the higher the absorbance reading.**

Investigating diffusion

Concentration:

1. Make some agar jelly with phenolphthalein and dilute sodium hydroxide. This will make the jelly pink.
2. Prepare 5 test tubes containing HCl in increasing concentrations e.g. 0.2M, 0.4M, 0.6M, 0.8M and 1.0M (synoptic link – serial dilutions).
3. Using a scalpel, cut out 5 equal size cubes from the agar jelly.
4. Put one of the cubes into the first test tube and use a stopwatch to time how long it takes for the cube to turn colourless.
5. Then repeat for the other concentrations, using a new cube each time.
6. **The highest concentration of HCl will have the fastest colour change as it has the steepest concentration gradient.**

Surface Area:

1. Use a similar method to the concentration method but cut the cubes in different sizes and work out the surface area to volume ratio.
2. **The smallest cube with the greatest surface area to volume ratio would go colourless fastest.**

Temperature:

1. Use a similar method to the surface area method but cut into equal sized cubes.
2. Prepare several boiling tubes with the same concentration of HCl.
3. Put the boiling tubes in water baths with different temperatures.
4. **The higher temperatures will make the cubes go colourless faster.**

