

**GCE BIOLOGY**  
**Investigative Skills Assessment**

**BIO3T/Q09/TN**

**Teachers' Notes**

**CONFIDENTIAL**

**Finding the water potential of potato tissue**

Candidates are required to carry out an investigation to find the water potential of potato tissue.

**Materials**

In addition to access to general laboratory equipment, each candidate needs

- 20 cm<sup>3</sup> of each concentration of sucrose solution (0.1, 0.2, 0.3, 0.4 and 0.5 mol dm<sup>-3</sup>).
- water-soluble dye solution e.g. methylene blue (this must be sufficiently concentrated so that when point 9 of the outline method is carried out, the drop of dye can be clearly seen.)
- a large potato (at least 4 cm long)
- apparatus necessary to cut the potato
- a cork borer
- white tile
- 10 test tubes
- test tube rack(s)
- Pasteur pipette
- stopwatch (or suitable alternative)
- permanent marker pen
- graduated pipettes or syringes capable of measuring up to 10 cm<sup>3</sup>
- paper towels
- ruler graduated in mm

**Managing the investigation**

Teachers may help candidates to interpret the instructions.

The potato cores should be left in the sucrose solutions for at least an hour. It is recommended that they are left for 24 hours so a significant change in density occurs. The teacher must decide how long the potato core should be left in the sucrose solutions.

In particular, candidates may require help with step 8 of the outline method, which should be demonstrated to them by the teacher. Candidates will need to practise this technique before attempting to collect data in the investigation. If the drop is released too rapidly, the momentum will take it to the bottom of the tube irrespective of its density. It is suggested that one dyed and one clear solution of different concentrations are used to practise the technique e.g.  $0.2 \text{ mol dm}^{-3}$  with dye and  $0.5 \text{ mol dm}^{-3}$  without dye.

Candidates may work in pairs to measure the rate of movement of the drop (step 9) but candidates must collect data from their own investigation. The roles of adding the drop and measuring the rate being reversed for each candidate's set of solutions.

**In this investigation, teachers must not give candidate the following information:**

- how many times to repeat readings for each sucrose concentration.

**One week before sitting Stage 1 of the ISA teachers may give their candidates the following information.**

You will be finding the water potential of potato tissue.

There should be no further discussion of this topic.