General Certificate of Education
Advanced Subsidiary Examination
June 2010

Human Biology HBI3T/P10/TN

Unit 3T AS Investigative Skills Assignment

Teachers' Notes Confidential

A copy should be given immediately to the teacher responsible for GCE Human Biology

Teachers' Notes

CONFIDENTIAL

These notes should be read in conjunction with *Instructions for the Administration of the Investigative Skills Assignment* on the ISA disk and published on the AQA Website.

The effect of different concentrations of sodium chloride solution on the percentage change in mass of carrot tissue

Candidates are required to measure changes in the mass of samples of cylinders of carrot cortex when they are placed in distilled water or in sodium chloride solutions of different concentrations.

Materials

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

- $50cm^3$ of distilled water
- $50cm^3$ of 0.15 mol dm^{-3}, 0.30 mol dm^{-3}, 0.45 mol dm^{-3} and 0.60 mol dm^{-3} sodium chloride solutions
- a large carrot
- access to a cork borer with internal diameter of between 6 mm and 10 mm
- access to a small kitchen knife or scalpel
- board, mat or tile on which to prepare carrot cylinders
- ruler marked in mm
- measuring cylinders or syringes to measure between 5 cm^3 and 10 cm^3
- boiling tubes (specimen tubes, crystallising dishes, petri dishes, small beakers or other small containers could be used but larger volumes of solutions might be required)
- racks for tubes (If there are not sufficient racks, small beakers could be used to hold test tubes)
- bungs/stoppers/lids/clingfilm to cover containers
- marker pen, chinagraph pencil or adhesive labels
- paper towels or kitchen roll
- access to a top-pan balance reading to 0.01 g

Managing the Investigation

Teachers should test the available carrots to estimate how much time is needed for significant changes in mass to occur and arrange the reweighing sessions accordingly. An interval of two or more hours may be required.

The task will need to be trialled before use.

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

You will investigate the effect of different concentrations of sodium chloride solution on the percentage change in mass of plant tissue.

There should be no further discussion of this topic.

In this investigation, teachers must not give candidates the following information

- the volume of liquid to be placed in each tube
- the number of discs in each sample.