AQA

General Certificate of Education
Advanced Subsidiary Examination
June 2012

Biology BIO3T/Q12/TN

Unit 3T AS Investigative Skills Assignment

Teachers’ Notes Confidential

A copy should be given immediately to the teacher responsible for GCE Biology
**Teachers’ Notes**

These notes must be read in conjunction with *Instructions for the Administration of the ISA: GCE Biology* published on the AQA Website.

**The effect of substrate concentration on the rate of an enzyme-controlled reaction**

**Materials**

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

- approximately 150 cm³ of 10 volume hydrogen peroxide. Candidates will need a total of 120 cm³. Label “Hydrogen peroxide”.
- approximately 100 cm³ of water. Candidates will need a total of 80 cm³. Label “Water”.
- approximately 5 cm³ of catalase extract. This should be made by liquidising celery and water in a proportion of approximately 10 g of celery to 10 cm³ of water. The resulting suspension should be strained through muslin or J cloth to remove the celery. The filtrate should be put into a Petri dish or other suitable container which will allow candidates to immerse an 8 mm by 8 mm card square. The catalase extract may be prepared the day before and stored in a refrigerator.
- pipettes or measuring cylinders to measure a minimum of 8 cm³ and a maximum of 40 cm³
- five boiling tubes and a rack in which to stand them
- marker or chinagraph pencil to write on the tubes
- forceps
- stopwatch or timer
- glass rod that will reach to the bottom of a boiling tube
- Petri dish or lid for waste card
- approximately 25 pieces of absorbent card cut to a size of about 8 mm × 8 mm. It is important that the card should be able to fit inside the boiling tube without touching the sides. This investigation was trialled using recycled card from supermarket egg-boxes. Blotting paper may be used as an alternative to recycled card. More card should be available if required.

**Managing the investigation**

If you have queries about the practical work for the ISA please contact your Assessment Adviser. Contact details can be obtained by emailing your centre name and number to biology-gce@aqa.org.uk. Please do not contact suppliers for advice.

It should be possible to carry out this investigation within a single practical session. Extending the work over more than one session will create difficulties as different catalase extracts will differ in activity.

**The task must be trialled before use.**

Candidates must **not** be given information about the ISA until one week before Stage 1. One week before Stage 1, teachers may give their candidates the following information.

You will investigate a factor affecting an enzyme-controlled reaction. In addition, you will also need to understand the following topic
- osmosis and water potential.

There must be **no** further discussion and candidates must **not** be provided with any further resources to prepare for the assessment.