



General Certificate of Education  
Advanced Level Examination  
June 2013

**Biology**

**BIO6T/Q13/TN**

Unit 6T A2 Investigative Skills Assignment

**Teachers' Notes**

**Confidential**

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

**Teachers' Notes****Confidential**

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

**An investigation of the energy content of foods rich in carbohydrates**

The type of carbohydrate consumed affects the speed at which glucose enters the blood. Candidates will use a simple method of calorimetry to investigate the energy content of two foods: one rich in starch and the other rich in sugars. Candidates are not expected to know anything about the composition of the foods used.

Candidates will carry out the experiment five times with two different foods. They may assume that this will provide enough raw data for a statistical test.

**Materials**

In addition to general laboratory equipment, each candidate needs:

- 2 cream crackers
- 5 marshmallows
- test tubes
- 10 cm<sup>3</sup> measuring cylinder (or pipette with pipette filler)
- water
- clamp and stand
- thermometer (capable of measuring the temperature change)
- mounted needle (or tongs)
- access to a balance (sensitivity is not important)
- Bunsen burner
- heat-resistant mat
- method of lighting Bunsen burner.

## Managing the investigation

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

The number of test tubes provided will depend on availability. Ten is the maximum requirement or they could be washed and reused as necessary. Candidates will need access to a balance and a Bunsen burner.

Candidates will break each cracker into four pieces. Providing two crackers will yield spare pieces. It may take a few moments to get the cream crackers to start burning and they may need to be relit a few times. Marshmallows will be used whole. In trials they continued to burn for about 20 seconds and temperature increases of at least 10°C were recorded. It is possible to hold both on a mounted needle but tongs can be used if preferred. Marshmallows melt as they are heated and a receptacle, such as a beaker, could be provided to catch debris during heating. It may help if the marshmallows are allowed to dry in air for a few days before use.

If the supply of balances is limited, or to save time, it is permissible to provide candidates with five pre-weighed pieces of cream cracker and five pre-weighed whole marshmallows. Candidates must be told the mass of each weighed piece of cream cracker and of each marshmallow they are given. If this approach is adopted, candidates must be told that steps 1 and 4 in the Task Sheet have been completed for them.

The investigation was successfully trialled using cream crackers and marshmallows obtained from several supermarkets.

The simple calorimeter does not provide a measure of total energy content but, for this investigation, that does not matter.

## Notes from CLEAPSS

In this investigation, where a large class is involved, there may be a lot of fumes from burning materials. Breathing in the fumes produced may be hazardous to people with respiratory diseases such as asthma or allergies. Centres should also be aware of the potential risk of triggering smoke alarms. It is advisable to keep the room well ventilated during and after the investigation.

While a mounted needle works well for a marshmallow, it is easier to hold a piece of cream cracker with tongs.

## Additional Information

AQA might publish Additional Information about an ISA/EMPA practical. This will be placed on e-AQA in Secure Key Materials. We will email Exams Officers who have downloaded the particular Teachers' Notes so they can print a copy for the Head of Biology. Additional Information will cover issues such as suitable suppliers or tips on getting a practical to work.

Turn over ►

## Trialling

The task must be trialled before use.

### Information to be given to candidates

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

You will investigate the energy content of foods rich in carbohydrates. In addition, you will need to understand the following topic:

- the control of blood glucose concentration.

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

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

- whether or not candidates should attempt to relight the cream cracker or marshmallow
- what data to record.