AQA

General Certificate of Education
Advanced Level Examination
June 2012

Biology

BIO6T/P12/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 must be read in conjunction with Instructions for the Administration of the ISA: GCE Biology published on the AQA Website.

An investigation of pigments present in leaves

Candidates are required to investigate pigments present in leaves. They will use chromatography to separate pigments contained in discs of leaf tissue. Candidates will use two leaves, one green and one yellow. The green leaf should be labelled A and the yellow leaf labelled B.

Please note that knowledge of chromatography is not a specification requirement. Candidates will follow a full set of instructions and use their understanding of what they have done to answer the questions that follow.

There are many leaves which work well in this investigation. They may be from the same or different species. This task was trialled successfully with raspberry, geranium and coleus. The leaves which gave the best results had thin cuticles.

The chromatograms will fade very quickly, particularly in the light. Teachers are advised to allow time for candidates to measure the values needed to calculate Rf values during Stage 1. Teachers are advised to keep the dried chromatograms in the dark and mark the results from Stage 1 as soon as possible after the practical session.

In Stage 2 of this investigation candidates are given data for statistical analysis.

Materials

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

- boiling tube rack
- two boiling tubes with bungs to fit
- approximately 10 cm$^3$ of propanone petroleum ether solvent in the ratio propanone : petroleum ether 1 : 9, supplied in a stoppered bottle and label 'Solvent'. (The experiment was trialled successfully with both 40 - 60°C and 60 - 80°C fractions of petroleum ether)
- small glass measuring cylinder to measure 3 cm$^3$ solvent
- chromatography or filter paper cut to size to fit the boiling tubes as shown in the diagram. The filter paper must not touch the sides of the tube. In trials, chromatography paper and filter paper gave good results but chromatography paper was better. For clarity, the term filter paper is used throughout the investigation.
- glass rod to crush leaf tissue into the filter paper
- two leaves, one green labelled A and one yellow labelled B
- small diameter cork borer – size 1 or 2
- a surface on which to use the cork borer such as a tile, rubber bung or corks. White tiles are listed on the Task Sheet for simplicity
- two drawing pins
- marker pen
- sticky tape
- pencil
- ruler with millimetre measurements.
Managing the investigation.

If you have any 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.

The task must be trialled before use.

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

You will investigate chlorophyll and other pigments found in leaves. In addition, you will also need to understand the following topic

- photosynthesis
- investigating populations.

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