General Certificate of Education
Advanced Level Examination
June 2014

Biology BIO6T/Q14/TN

Unit 6T A2 Investigative Skills Assignment

Teachers' Notes Confidential

The Exams Officer should make two copies of these Teachers' Notes; one copy for the Head of A-level Biology and one for the technician.
These copies can be released to the Head of A-level Biology and the technician at any point following publication but must be kept under secure conditions at all times.
Teachers can have sight of the Teachers' Notes but no further copies should be made.

All teacher-assessed marks to be submitted by 15 May

Teachers' Notes

Confidential

These notes should be read in conjunction with **Instructions for the Administration of the ISA: A-level Biology** published on the AQA Website. Please note that these have been revised for 2014.

Investigating populations

Candidates will investigate features of plant, animal and human populations. Within the timescale, obtaining primary data for animals or humans would be difficult. In this investigation, candidates will therefore use a plant population. For a particular plant species, they will investigate whether there is a relationship between the dimensions of leaves and the direction that the leaves face. For this activity, leaves from the same plant species must be used. Where there is a need to consider animal or human populations, information or data will be supplied.

Materials

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

- access to a compass (the teacher can identify a suitable site for investigation)
- 20 leaves of various sizes, attached to or removed from the same plant species
  - 10 from the north-facing side of the plant
  - 10 from the south-facing side of the plant
- flat surface, such as a piece of card or tile (to press the leaf against)
- a 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 science-gce@aqa.org.uk

Candidates will need to measure 20 leaves of one plant or plants of the same species. Preferably, candidates will make their measurements where the plants are growing but leaves could be removed and measurements made in the laboratory or classroom. Any plant species can be used but the plants must have both north-facing and south-facing sides. In trials, a beech hedgerow and a laurel bush were both used successfully. It was found better to use plants that produce large leaves, so that differences in dimensions were distinguishable. Teachers can either provide candidates with a compass, leaving them to decide which plants to investigate, or they can tell candidates which plants to investigate.

Note from CLEAPSS

The leaves of some plants are poisonous. Hands should be washed after handling leaves.

Trialling

Centres will need to establish beforehand where a suitable site, such as a hedgerow with north-facing and south-facing sides, is located. Plans should be in place for how to deal with inclement weather conditions.

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 that 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.

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, teachers should give their candidates the following information.

You will investigate a plant population. In addition, you will need to understand the following topics:

- investigating populations
- variation in population size
- human populations.

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

Task Sheet

Investigating populations

Introduction

You will use leaves of the same plant species to investigate whether there is a relationship between the dimensions of a leaf and the direction the leaf faces.

Materials

You are provided with the following:

- access to a compass (or your teacher will tell you which side of the plant is north-facing and which side is south-facing)
- access to 20 leaves of various sizes, from the same plant species
- flat surface
- ruler.

You may ask your teacher for any other apparatus you require.

Method

Read these instructions carefully before you start your investigation.

Measuring leaves from the north-facing side of the plant

1. Choose a complete leaf from the north-facing side of the plant.

2. Use the ruler to press the leaf against your flat surface.

3. Measure the length of the leaf, in millimetres, but do not include the leaf stalk. Record your results in **Table 1**.

4. Measure the width of the leaf in millimetres. Record your results in **Table 1**.

5. Repeat steps 1 to 4 with nine more north-facing leaves.

Measuring leaves from the south-facing side of the plant

6. Choose a complete leaf from the south-facing side of the plant.

7. Repeat steps 2 to 4.

8. Repeat steps 6 and 7 with nine more south-facing leaves.

You will have recorded the results for 20 leaves in **Table 1**. You may assume that this will give you sufficient data for a statistical test.

You will need to decide for yourself:

- where to measure a leaf to obtain its greatest length
- where to measure a leaf to obtain its greatest width.