

**ADVANCED GCE
BIOLOGY**

2806/03/INST

Instructions for the Planning Exercise and Practical Test

To be opened immediately

Planning Exercise – for issue on or after:

17 NOVEMBER 2007

Practical Test:

WEDNESDAY 23 JANUARY 2008

Morning

1 hour 30 minutes



This document is for the **Head of Centre** and for the use of the **Biology teacher and/or technician** who prepares the apparatus and materials for the examination.

A packet containing **two** copies of the Biology Practical Test, 2806/03/TEST, accompanies the packet containing these Instructions.

These packets should be issued to the Biology teacher immediately they arrive at the Centre, but they **must be kept in a secure place at all times**.

These documents are provided so that the Biology teacher and/or technician can ensure that the Centre's apparatus and materials are suitable for carrying out the Biology Practical Test.

Great care should be taken that any confidential information given here does not reach the candidates, either directly or indirectly.

This document consists of **8** printed pages.

PLANNING EXERCISE

The Planning Exercise should be issued to candidates on or after the date shown on the front of these instructions. The candidates' plans must be collected in, on or before the date of the Practical Test. These arrangements may be made at the discretion and convenience of the Centre.

It should be recognised that each Planning Exercise makes only a small contribution to the overall assessment and candidates should therefore be guided to spend an appropriate amount of time on the work. It is suggested that they should be given **between 7 and 10 days** to complete it.

The mark scheme for the Planning Exercise is based closely on the coursework mark descriptors for Skill P given in the Specification and a copy of these descriptors should be made available to candidates to assist them in their work.

Candidates may be given access, if they request it, and at the discretion of the Centre, to laboratory space and facilities in order to be able to carry out preliminary work which will help in constructing their plan. However, it should be noted that the responsibility for Health and Safety during this period rests with the Centre, and the attention of teachers is drawn to the Health and Safety section in the Specification. Access to suitable library and other resources may also be required and, while time at home or in private study will be necessary to complete the task to a high standard, sufficient work must be completed under direct supervision to allow the teacher to authenticate the work with confidence as that of the candidates concerned. Many Centres find that this can best be managed by allowing candidates a set period of time to research the topic but requiring the Plan to be written under supervision. The supervising teacher should complete the statement of authentication for each candidate on the front cover page of the Plan. Details should be provided on the Report Form for the Practical Test of any assistance given to candidates.

After candidates' work has been collected, it must be kept securely until the date of the Practical Test (or must be collected on the day of the Practical Test) and must be included with the scripts for the Practical Test when these are despatched to the Examiner. Please tie together **loosely** the Planning Exercise and Practical Test for each candidate (or use a treasury tag), with the **Practical Test on the top**.

Guidance for Teachers/Tutors on authenticating work

The work submitted by candidates for assessment must be entirely their own.

Candidates may however:

- quote from books or any other source; this should be referenced in the work and all sources acknowledged;
- receive guidance from someone other than their teacher/tutor; the course teacher must be informed of the name of the person giving external guidance and the nature of the assistance given;
- produce work at a location away from the examination Centre provided that the work remains under the supervision of the teacher/tutor.

In cases of privately entered candidates or distance-tutored candidates, the Centre must ensure that:

- the teacher/tutor has acquainted themselves thoroughly with the general standard of candidates' work before accepting work for assessment;
- sufficient on-going regular monitoring of candidates' work has taken place.

Before authenticating work, the teacher/tutor should ask themselves the following basic questions.

- Has the **Declaration by candidate** been signed by the candidate?
- Was at least part of the work done under your direct supervision?
- Did you check the work during its production?
- Is the standard of finished work consistent with your professional judgement of the candidate's ability?

If you have answered 'YES' to the above questions you may authenticate the work.

The following notes for guidance are issued to candidates

- 1 Your plan should have a clear and helpful structure and should be illustrated by diagrams, tables, charts, graphs etc. as appropriate. Remember that these can often be used to replace words in the text. Diagrams should be relevant to the content of your plan and positioned appropriately. Labels on diagrams, flow charts or tables should be clear and concise. Large blocks of text should be included in the word count.
- 2 You should take care to use technical and scientific terms correctly and to write in clear and correct English.
- 3 Your plan should be hand-written or word-processed on A4 paper which should have a hole punched at the top left hand corner. Pages should be numbered and should have a clear margin on the right hand side. **You should write (or print) on one side of the paper only** and each sheet should be marked with your Centre number and Candidate number.
- 4 You should show that you have consulted an appropriate range and variety of sources. At the end of your plan you should list clearly the sources you have used and should refer to these references in your plan where appropriate. Where you have incorporated material which has been copied directly from a source such as a book or the Internet, this must be acknowledged in the report and details included in the references at the end. However, it should be noted that the inclusion of copied material will not in itself gain credit. The list of references should not be included in the word count.
- 5 Your plan should be based on the use of standard equipment and other materials available in a school or college science laboratory.
- 6 Your plan should be of between 500 and 1000 words. A plan which is in excess of 1000 words is likely to have poor structure and unselective choice of material, so that full credit may not be available. You should indicate the number of words in the margin of the plan at approximately 200 word intervals.
- 7 When you have finished, tie the pages **loosely** together, with this sheet on the top, so that the pages turn over freely, or use a treasury tag. Your Centre will give you the date by which it must be handed in.

PLANNING EXERCISE (continued)

Centres are reminded that candidates only need to appreciate how to carry out an investigation in sufficient detail for them to write a Plan. They do not need to carry out the investigation for themselves.

If candidates wish to try out the procedure they may be provided with the following:

- 1 Shade leaves and sun leaves. These leaves should **not** be variegated.
- 2 1.0 mol dm^{-3} sodium hydrogencarbonate (NaHCO_3) solution for making appropriate dilutions.
- 3 Cork borers or wide drinking straws to cut leaf discs.
- 4 10 cm^3 syringes.
- 5 Light source.
- 6 White tile.
- 7 Thermometer.

However, candidates may wish to use other apparatus not included in this list. If they make reasonable requests for other pieces of apparatus that can be provided by the Centre, then they should have access to them.

PRACTICAL TEST

General Instructions

The attention of teachers is drawn to the details of this examination given in Appendix E of the Specification.

The Biology teacher and/or technician **must** be granted access to the question paper in advance of the Practical Test in order to be satisfied that apparatus and materials are in accordance with these Instructions and are fully suitable for the performance of the experiments. To this end, the Biology teacher and/or technician should perform Questions 1 and 2 of the Practical Test and be satisfied that the candidates will be able to collect suitable results with the apparatus and materials provided. **A sample set of results, clearly labelled, should be sent to the Examiner on top of the candidates' scripts.**

If the apparatus or materials that are supplied to candidates differ significantly from these Instructions, then full details of the changes must be given on the Report Form. Candidates will not be disadvantaged provided that the nature of the experiments has not been changed. **The Biology teacher and/or technician is advised to contact OCR well before the date of the examination if, for example, there are difficulties with obtaining and/or using materials or particular pieces of apparatus.**

Candidates should be informed that, if they find themselves in real difficulty, they may ask the Supervisor for assistance but the extent of this assistance will be reported to the Examiner, who may make a deduction of marks. If the Supervisor becomes aware that a candidate is having difficulty, then the Supervisor is expected to give the minimum amount of help required to enable the candidate to obtain a set of results from the apparatus. A note of the type of help given **must** be made on the Report Form on the last page of the candidate's script. **Under no circumstances should help be given to candidates with the presentation or analysis of experimental data.**

In cases of faulty apparatus (not arising from a candidate's mishandling) that prevents the required readings from being taken, extra time must be allowed so that the candidate has a fair opportunity of performing the experiment as though the fault had not been present. Details of such cases of time compensation should be given in section (c) on the Report Form.

Cases of individual hardship, e.g. illness, should be reported directly to OCR by the Examinations Officer using the Special Consideration form and **must not** be included on the Report Form. Access Arrangements must be applied for by the deadlines issued by the Joint Council.

HEALTH AND SAFETY

Attention is drawn to the section on Health and Safety in Appendix B of the Specification. This section covers the practical test as well as coursework. Centres are reminded that, in UK law, the responsibility for Health and Safety lies with the employer.

Materials used in the examination should display appropriate hazard symbols.

PRACTICAL TEST (continued)

Each candidate must be provided with the following apparatus and materials.

Question 1

- (i) 5 cm³ of DCPIP solution in a small beaker labelled **DCPIP solution**.
- (ii) 10 cm³ of leaf extract in a small beaker (20 or 25 cm³) labelled **leaf extract**.
- (iii) Dropping pipette.
- (iv) Six 100 mm melting point tubes to act as capillary tubes in the procedure. Have spares available.
- (v) A purple, blue, green, orange and red filter folded longitudinally to form a 'tent'.
- (vi) White tile.
- (vii) Glass rod.
- (viii) Rectangle of foil to wrap around the beaker.
- (ix) Circular foil cap to cover the beaker in (viii) above.
- (x) Paper towels.
- (xi) Bench lamp. All candidates should use lamps with 60W bulbs.
- (xii) Stopclock, stop watch or bench timer.
- (xiii) Ruler (cm/mm)

Recipes for the preparation of buffer solution, DCPIP solution and leaf extract.**Buffer solution**

Prepare 500 cm³ of pH 7.5 **buffer solution** by dissolving 4.5 g of disodium hydrogen phosphate [Na₂HPO₄] and 1.7 g potassium dihydrogen phosphate [KH₂PO₄] in 450 cm³ of distilled water. When thoroughly dissolved, make up to a total volume of 500 cm³ with distilled water (or deionised water). Check the pH of the buffer and adjust if necessary. The addition of potassium dihydrogen phosphate will lower pH, disodium hydrogen phosphate will raise pH.



The buffer solution will be used to make both the DCPIP solution and the leaf extract.

DCPIP solution

Dissolve 0.2 g of 2,6-dichlorophenolindophenol (DCPIP) and 0.9 g of potassium chloride in 250 cm³ of the **buffer solution**. Refrigerate until required. Provide to the candidates in a small beaker labelled **DCPIP solution**.

**Leaf extract**

This must be prepared on the day of the practical examination.

Dissolve 13.7 g of sucrose and 0.1 g of potassium chloride in 100 cm³ of the **buffer solution**. Refrigerate until required.



Take spinach leaves and remove any midrib or large veins with scissors. Cut the remaining leaf material into small pieces. Add approximately 15 g of the leaves to the above sucrose potassium chloride solution and liquidise to separate and disrupt the cells. Filter this leaf extract through muslin and decant the green liquid obtained into a beaker.

The leaf extract should be placed in a refrigerator before being provided to each candidate in a suitable container labelled **leaf extract**.

Suggested supplier:

Information correct at time of printing.

Melting point tubes, catalogue number ME10375 (2007–2008 catalogue) from:

Timstar Laboratory Suppliers Ltd.
Timstar House
Marshfield Bank
Crewe
Cheshire
CW2 8UY
Tel: 01270 250459
Fax: 01270 250601
email: sales@timstar.co.uk

To be supplied by OCR:**Question 1**

- (i) One purple, blue, green, orange and red filter (per candidate). These **do not** need to be returned to OCR after the practical examination.

Question 2

- (ii) Insert containing Fig. 2.1 and Fig. 2.2.

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