

**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:

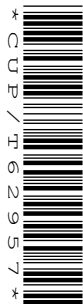
THURSDAY 13 MARCH 2008

Practical Test:

TUESDAY 20 MAY 2008

Afternoon

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 this document. 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. Candidates 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** (or use a treasury tag) the Planning Exercise and Practical Test for each candidate **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.

PLANNING EXERCISE (continued)

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. You 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 your Plan 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, apparatus, chemicals and other materials available in a school or college science laboratory.
- 6 Your Plan should be of between 500 and 1000 words. A Plan that 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 (or use a treasury tag), with this sheet on the top, so that the pages turn over freely. Your Centre will give you the date by which your Plan must be handed in.

Centres should be 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 it out for themselves.

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

Deionised water may be used in place of distilled water throughout.

1 10 g 100 cm⁻³ solution of urea (10%).

This is prepared by dissolving 10 g urea in 3–4 cm³ distilled water and then making up to 100 cm³ with distilled water.

Candidates will use this to make a series of dilutions so will need an additional supply of distilled water.

2 5 g 100 cm⁻³ solution of urease (5%).

This is prepared by dissolving 5 g urease active meal in 3–4 cm³ of distilled water and then making up to 100 cm³ with distilled water. Allow to stand for a few minutes and then filter through coarse filter paper.

Alternatively, this solution may be prepared using urease tablets.

3 0.1 mol dm⁻³ ethanoic acid.

If candidates are following the change in pH using Universal indicator solution, they may need to acidify the urea solutions before adding urease.



4 0.1 mol dm⁻³ hydrochloric acid.

This is used to titrate against ammonium carbonate using screened methyl orange as the indicator.



5 pH indicators e.g. litmus paper, Universal indicator solution/paper, phenolphthalein, screened methyl orange.

6 Water bath or beakers, tripods, gauzes and Bunsen burners; thermometers.

7 Syringes, beakers, conical flasks, graduated pipettes, dropping pipettes, burettes, test-tubes, boiling tubes, spatulas, funnels, and stop clock, stopwatch or bench timer.

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.

Suggested supplier:

Urea (UR6432), urease active meal (UR6438) and urease tablets (UR6444) may be obtained from:

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

PRACTICAL TEST

General Instructions

The attention of teachers is drawn to the details of this examination given in the Biology Specification Appendix E, pages 105–6.

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.**

The Biology teacher and/or technician should also check **all** the slides supplied by OCR.

If the apparatus or materials that are provided 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 materials or particular pieces of apparatus.

Candidates should be informed that, if they find themselves in real difficulty, they may ask the Invigilator for assistance but the extent of this assistance will be reported to the Examiner, who makes a deduction of marks. If the Invigilator becomes aware that a candidate is having difficulty, then the Invigilator 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 should 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 made on the Report Form.

Cases of individual hardship, e.g. illness, disability etc. should be reported direct to OCR using the 'Special Considerations' form and **not** included on the Report Form.

As Question 2 involves using shared slides, some candidates must start with Question 2.

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

Question 1

- (i) At least 20 cm^3 of each of the sucrose solutions **A** to **E** as follows:

beaker	sucrose concentration/ $\text{g } 100\text{ cm}^{-3}$
A	7.5
B	5.0
C	2.5
D	1.0
E	0.5

These solutions should be supplied to candidates in beakers **labelled A to E**.

Analar reagent must be used to make the sucrose solutions so that they are free of reducing sugar.

Prepare two stock solutions of sucrose as follows:

Deionised water may be used in place of distilled water throughout.

10 g 100 cm^{-3} solution

Put 10 g of Analar sucrose into a suitable container and add $3\text{--}4\text{ cm}^3$ of distilled water. Stir until the sucrose has dissolved and then make up to 100 cm^3 with distilled water.

1 g 100 cm^{-3} solution

Put 1 g of Analar sucrose into a suitable container and add $3\text{--}4\text{ cm}^3$ of distilled water. Stir until the sucrose has dissolved and then make up to 100 cm^3 with distilled water.

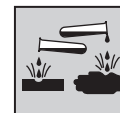
Use the $10\text{ g } 100\text{ cm}^{-3}$ stock solution and the $1\text{ g } 100\text{ cm}^{-3}$ stock solution to make the sucrose solutions **A** to **E** in **labelled beakers** as follows:

beaker	volume of $10\text{ g } 100\text{ cm}^{-3}$ sucrose solution/ cm^3	volume of $1\text{ g } 100\text{ cm}^{-3}$ sucrose solution/ cm^3	volume of distilled water/ cm^3	sucrose concentration/ $\text{g } 100\text{ cm}^{-3}$
A	15	—	5	7.5
B	10	—	10	5.0
C	5	—	15	2.5
D	—	20	0	1.0
E	—	10	10	0.5

- (ii) 20 cm^3 of $2\text{ g } 100\text{ cm}^{-3}$ sucrose solution in a beaker labelled **F**.

Prepare this from the $10\text{ g } 100\text{ cm}^{-3}$ stock solution by diluting 4 cm^3 of the stock solution with 16 cm^3 distilled water.

- (iii) 20 cm³ 1 mol dm⁻³ hydrochloric acid in a 100 cm³ beaker or other suitable container labelled **dilute hydrochloric acid**.



- (iv) 20 cm³ 1 mol dm⁻³ sodium hydroxide in a 100 cm³ beaker or other suitable container labelled **dilute sodium hydroxide**.



- (v) 20 cm³ Benedict's solution in a 100 cm³ beaker or other suitable container labelled **Benedict's solution**.

- (vi) Six test-tubes (e.g. 12 cm × 1.4 cm) provided in a test-tube rack; test-tube holder.

- (vii) 400 cm³ **glass beaker** to act as a hot water bath; Bunsen burner, gauze and tripod **or** hot plate for heating water; thermometer.

Candidates should be provided with hot water for setting up their water bath and are not expected to boil water from cold.

Candidates should also have access to hot and cold water for steps **7** and **8**.

- (viii) 2 × 10 cm³ syringes; 2 × 5 cm³ syringes; 2 cm³ syringe.

- (ix) Permanent marker or chinagraph pencil.

- (x) Glass rod.

- (xi) A beaker or other suitable container labelled **waste water**.

- (xii) Stopwatch, stop clock or bench timer.

- (xiii) Eye protection.

- (xiv) Paper towels.

Question 2

- (i) A microscope with low power and high power objectives (×10 and ×40).

Each candidate must have sole use of a microscope for at least 35 minutes.

- (ii) Slide **S** from OCR.

HEALTH AND SAFETY

Attention is drawn to the section on Health and Safety on pages 96 and 97 in Appendix B of the Biology Specification. Centres are reminded that, in UK law, the responsibility for Health and Safety lies with the employer.

Materials used in the examination should display their appropriate hazard symbols.

RETURN OF EXAMINATION MATERIALS TO OCR

Please read the following instructions carefully.

Immediately after the examination the slides must be returned to OCR in the containers in which they were received, using the self-adhesive labels for the parcel. They must not be included in parcels of scripts.

Please clearly indicate your Centre number when returning slides.

Slides and containers not returned in good condition will be charged at the rate of £3 per item.

The address for the return of slides is:

Ian Couchman,
Cambridge Assessment DC10,
Hill Farm Road,
Whittlesford,
CAMBRIDGE.
CB22 4FZ.

On occasion, it may be possible for OCR to offer certain slides used in the examination for sale to Centres.

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