OCR
RECOGNISING ACHIEVEMENT

ADVANCED SUBSIDIARY GCE **2803/03/INST**

BIOLOGY

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: Afternoon

TUESDAY **13 MAY 2008** Time: 1 hour 30 minutes

CUP/T39364

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, 2803/03/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.

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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 Biology Specification. 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 Biology Specification. Access to suitable library and other resources may also be required. 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 distant 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 must 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 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.

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PLANNING EXERCISE (continued)

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 out the investigation for themselves.

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

1 Rennin solution.

This is sold as 'Essence of Rennet' in shops and supermarkets.

Centres may also wish to use fungal 'rennin' (Fromase®) which is available from the NCBE (address below). If Fromase® is used, a 10% solution is recommended although candidates may wish to use other concentrations.

2 Milk.

3 Test-tubes, boiling tubes, beakers, test-tube racks, microscope slides, glass rods, thermometers, thermostatically-controlled water bath or beakers, tripods, gauzes and Bunsen burners.

4 Distilled water, pipettes, measuring cylinders, syringes.

5 Sodium citrate in a beaker labelled **sodium citrate**.

This can be prepared by adding 15 cm^3 of 1 mol dm^{-3} sodium hydroxide solution to 100 cm^3 of 3% sodium citrate solution.

6 1.0 mol dm^{-3} calcium chloride solution.

7 Universal Indicator solution or paper, pH meter or pH probe and data logger.

8 Stopwatch, stop clock 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.

National Centre for Biotechnology Education,
Science and Technology Centre,
Earley Gate,
The University of Reading,
Whiteknights,
Reading.
RG6 6BZ

Tel.: 0118 9873 743
Fax: 0118 9750 140
e-mail: NCBE@reading.ac.uk
web site: www.ncbe.reading.ac.uk

PRACTICAL TEST

General Instructions

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

The Biology teacher and/or technician should also check **all** materials 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 strongly 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) which 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 direct 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 Biology Specification. This section covers Practical Tests 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.

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

Question 1

As this question involves the use of enzymes, the distilled (or de-ionised) water used to prepare solutions **must** be pH 7.0.

(i) 100 cm^3 of milk solution in a beaker labelled **milk**. This must be prepared as follows:

Add 10 g of **Coffee-mate® original** (do not use fat-free Coffee-mate®) to 100 cm^3 hot (approximately 80 °C) distilled (or de-ionised) water and mix well.
To this solution add 0.1 g calcium chloride.

The milk solution **must** be prepared on the day of the examination and provided to the candidates at room temperature.

A different brand of coffee whitener may be used providing it has a fat content of 30–35 g per 100 g.

(ii) 20 cm^3 of 5% *Lipex*® solution in a beaker labelled **lipase**. This must be prepared as follows:

5 cm^3 *Lipex*® to 100 cm^3 cold distilled (or de-ionised) water and stir thoroughly.

This must be prepared <u>just</u> before the examination.

A fresh supply of *Lipex*® **must** be obtained from the NCBE for this examination. **No other source of lipase should be used.** Please quote '**OCR Batch 2008**' when placing your order (see page 8).

You **must** follow the recommended safety and handling precautions provided on the product data sheet.

The Biology teacher and/or technician **must** ensure that satisfactory results are obtained using the 5% *Lipex*® from the NCBE. Results should show a trend in the times recorded for tubes **A** to **F**.

(iii) 50 cm^3 of sodium carbonate solution in a beaker labelled **sodium carbonate**. This must be prepared as follows:

Add 95 cm^3 distilled (or de-ionised) water to 0.3 g of anhydrous sodium carbonate, stir to dissolve and then add distilled (or de-ionised) water to make up to 100 cm^3.

(iv) 10 cm^3 of phenolphthalein in a beaker or dropping bottle labelled **phenolphthalein**.

(v) 50 cm^3 distilled (or de-ionised) water provided in a beaker labelled **water**.

(vi) Twelve test-tubes (e.g. 12 × 1.4 cm), six labelled **A** to **F** and six labelled **1** to **6**; test-tube rack or racks; one bung to fit all test-tubes; test-tube holders; one dropping pipette; stopwatch, stop clock or bench timer; glass rod.

(vii) 2 × 10 cm^3 syringes; 2 × 2 cm^3 syringes and 2 × 1 cm^3 syringes.

(viii) One 400 cm^3 beaker to act as a water bath; Bunsen burner; tripod; gauze; thermometer.

Supplies of warm water should be available so that candidates do not have to heat water from cold. Candidates must **not** use thermostatically-controlled water baths, but they may have access to one to collect water at 55–60 °C.

(ix) A beaker of distilled (or de-ionised) water labelled **washing water** and a container for waste water labelled **waste water**.

(x) Paper towels.

Question 2

Candidates must be provided with a hand lens and a microscope with low power objectives e.g. ×10. Each candidate must have sole use of a microscope for 30 minutes.

(i) Two transverse sections of celery petiole stained to show the presence of lignin.

*The sections should be prepared in a fume cupboard or a well ventilated area **on the day of the examination**.*

These **must** be prepared as follows:

Cut transverse sections of celery petiole 2 to 3 mm in thickness.

Place the sections in petri-dishes (or other appropriate containers) in 5% phloroglucinol solution for 30 seconds. Remove the sections using forceps and place in a clean petri-dish. Add **one** drop of concentrated hydrochloric acid to each section.

11°C

The lignin will then be observed as discrete red dots.

Use the petri-dish lid to cover the sections to prevent drying out (these containers should be labelled **K1**).

Each candidate should be provided with **two** transverse sections. There should be a supply of extra material available.

(ii) A small quantity of tinned rhubarb provided in a small beaker labelled **K2**. (Rhubarb in syrup is suitable for this procedure).

(iii) Distilled (or de-ionised) water provided in a beaker labelled **water**.

(iv) Forceps; mounted needle; petri-dish; 2 microscope slides; 2 cover slips; disposable pipette; filter paper.

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Lipex® **must** be sourced from:

National Centre for Biotechnology Education,
Science and Technology Centre,
Earley Gate,
The University of Reading,
Whiteknights,
Reading.
RG6 6BZ
Tel.: 0118 9873 743
Fax 0118 9750 140
e-mail: NCBE@reading.ac.uk
web site: www.ncbe.reading.ac.uk

Please quote '**OCR Batch 2008**' when placing your order.

5% phloroglucinol is available from:

Timstar (PH4620 – 100 ml) 2007/08 catalogue

Timstar Laboratory Suppliers Ltd.,
Timstar House,
Marshfield Bank,
Crewe,
Cheshire.
CW2 8UY
Tel.: 01270 250459
Fax 01270 250601
e-mail: sales@timstar.co.uk
web site: www.timstar.co.uk

and also from:
Scientific and Chemical Supplies (PH145 – 100 ml) 2008 catalogue

Scientific & Chemical Supplies Ltd.,
Carlton House,
Livingstone Road,
Bilston,
West Midlands.
WV14 0QZ
Tel.: 0845 1650845
Fax 01902 402343
e-mail: customerservices@scichem.com
web site: www.scichem.com

To be supplied by OCR

(i) Fig. 2.1 on an insert.