

**ADVANCED GCE****BIOLOGY**

Practical Examination 2 (Part A – Planning Exercise)

For issue on or after: **Friday 13 March 2009****2806/03/PLAN**

Candidate Forename		Candidate Surname	
-----------------------	--	----------------------	--

Centre Number						Candidate Number				
---------------	--	--	--	--	--	------------------	--	--	--	--

TIME This Plan must be handed in by the deadline given by your teacher.**INSTRUCTIONS TO CANDIDATES**

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Attach this booklet to the front of your Plan.

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [] at the end of each question or part question.
- In this Planning Exercise, you will be assessed on the Experimental and Investigative Skill:
Skill P: Planning
- You will be awarded marks for the quality of your written communication.
- Detailed notes for guidance are given overleaf.
- This document consists of **4** pages. Any blank pages are indicated.

Authentication by teacher

I declare that, to the best of my knowledge, the work submitted is that of the candidate concerned. I have provided details on my Report Form for the Practical Test of any assistance given.

Signature Date

FOR EXAMINER'S USE		
Qu.	Max.	Mark
Planning	16	

Notes for guidance

- 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 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.

NOTICE TO CANDIDATE

The work you submit for assessment must be your own.

If you copy from someone else or allow another candidate to copy from you, or if you cheat in any other way, you may be disqualified from at least the subject concerned.

- 1 Any help or information you have received from people other than your subject teacher(s) must be clearly identified in the work itself.
- 2 Any books, information leaflets or other material (e.g. videos, software packages or information from the Internet) which you have used to help you complete this work must be clearly acknowledged in the work itself. To present material copied from books or other sources without acknowledgement will be regarded as deliberate deception.

Declaration by candidate

I have read and understood the **Notice to Candidate** (above). I have produced the work without any help from other people apart from that which I have declared in the work itself. I have acknowledged all source materials in the work itself.

Candidate's signature: Date:

Planning Exercise

In this Planning Exercise, two marks are available for the quality of your written communication.

This Planning Exercise is about investigating the effects of gibberellic acid on germinating cereal grains.

Cereal grains, such as barley, contain an embryo and endosperm, which is a storage tissue. During germination, amylase enzymes are produced in the aleurone layer around the endosperm. These enzymes diffuse into the endosperm and catalyse the breakdown of starch reserves to maltose. The production of amylases in the aleurone layer is triggered by the release of gibberellin from the embryo.

Gibberellin is also known as gibberellic acid and as GA_3 .

Barley grains are used in the making of beer to provide maltose. During the malting stage, gibberellin is often sprayed on the grains to increase the production of maltose.

You are required to plan an investigation into the effect of different concentrations of gibberellin on amylase activity in germinating cereal grains.

Amylase activity is determined by the rate at which starch is broken down to give reducing sugars. The activity may be determined by measuring the rate of breakdown of starch or the rate at which reducing sugars are produced. This may be done by making an extract containing amylase from the grains and reacting it with a starch solution. It is also possible to determine amylase activity by placing grains that are cut in half onto starch-agar in Petri dishes.

The natural concentration of gibberellins in plant tissue is very low, approximately $346 \times 10^{-6} \text{ g dm}^{-3}$ which is equivalent to $1.0 \text{ } \mu\text{mol dm}^{-3}$.

Your planning must be based on the assumption that you are provided with the following:

- cereal grains, e.g. barley, wheat or maize
- 1 g dm^{-3} solution of gibberellin (gibberellic acid) which is approximately $3 \times 10 \text{ mol dm}^{-3}$ (3 mmol dm^{-3})
- 10 g dm^{-3} starch solution
- iodine in potassium iodide solution
- Benedict's solution
- starch-agar in Petri dishes
- school or college laboratory resources.

Give full details of your Plan to include:

- the apparatus and materials to be used
- a detailed method to include procedures that you would adopt to ensure that the results obtained were as precise and reliable as possible
- a risk assessment and safety precautions.

Indicate briefly how you would present and analyse your data to draw your conclusions.

You are strongly recommended to consult the descriptors for Skill P as given in Appendix C of the Biology Specification. [14]

Quality of Written Communication [2]

[Total: 16]

**Copyright Information**

OCR is committed to seeking permission to reproduce all third-party content that it uses in its assessment materials. OCR has attempted to identify and contact all copyright holders whose work is used in this paper. To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced in the OCR Copyright Acknowledgements Booklet. This is produced for each series of examinations, is given to all schools that receive assessment material and is freely available to download from our public website (www.ocr.org.uk) after the live examination series.

If OCR has unwittingly failed to correctly acknowledge or clear any third-party content in this assessment material, OCR will be happy to correct its mistake at the earliest possible opportunity.

For queries or further information please contact the Copyright Team, First Floor, 9 Hills Road, Cambridge CB2 1PB.

OCR is part of the Cambridge Assessment Group; Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.