

OXFORD CAMBRIDGE AND RSA EXAMINATIONS
Advanced GCE

BIOLOGY **2806/03/PLAN**

Practical Examination (Part A): Planning Exercise

For issue on or after: Monday **12 NOVEMBER 2001**

This plan must be handed in by the deadline given by your teacher.

Candidate Name	Centre Number	Candidate Number											
	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 15px; height: 15px;"></td> <td style="width: 15px; height: 15px;"></td> <td style="width: 15px; height: 15px;"></td> <td style="width: 15px; height: 15px;"></td> <td style="width: 15px; height: 15px;"></td> <td style="width: 15px; height: 15px;"></td> </tr> </table>							<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 15px; height: 15px;"></td> <td style="width: 15px; height: 15px;"></td> <td style="width: 15px; height: 15px;"></td> <td style="width: 15px; height: 15px;"></td> <td style="width: 15px; height: 15px;"></td> </tr> </table>					

INSTRUCTIONS TO CANDIDATES

- Write your name in the space above.
- Write your Centre number and Candidate number in the boxes above.
- Attach this page to the front of your plan.

INFORMATION FOR CANDIDATES

- 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.

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		
	Max.	Mark
Planning	16	

This question paper consists of 3 printed pages and 1 blank page.

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 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, 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, 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

You are required to plan an investigation to find out the compensation point of some leaves. The compensation point is the particular light intensity at which gaseous exchange in photosynthesis and respiration are equal so that no net loss or gain of oxygen or carbon dioxide occurs.

A convenient method for carrying out the investigation involves using discs punched from radish cotyledons (first "leaves") and is described below.

Use a plastic straw to punch out discs from the cotyledons of the radish plants provided.

Do this by placing a finger underneath the cotyledon to support it.

Keep the discs in the straw for the moment.

Remove the plunger from a 10 cm³ syringe.

Place a finger over the nozzle and approximately half-fill the syringe with sodium hydrogen carbonate solution.

Gently blow the discs from the straw into the syringe.

Replace the plunger.

Invert the syringe and push the plunger up far enough to expel the air from the syringe.

Place a finger over the nozzle of the syringe and gently pull out the plunger a short distance (past a 3 cm³ 'distance' on the syringe barrel). Hold the plunger at this position for a few seconds, then remove your finger from the nozzle.

This procedure causes air inside the discs to be replaced by the solution.

Repeat this procedure **twice** more.

Hold the syringe vertically, nozzle upwards and tap the syringe barrel between each evacuation. At this stage the leaf discs should sink. If this does not happen repeat the evacuation process.

When illuminated the discs will photosynthesise. Oxygen released will accumulate in the air spaces and, after several minutes, the discs will float to the surface.

Plan your investigation to find the compensation point on the assumption that you have the following:

- a supply of about two week old healthy radish seedlings with well-developed cotyledons
- sodium hydrogen carbonate solution of an appropriate concentration
- plastic drinking straws

In addition you have access to your school or college laboratory resources.

Give full details of your method to include the procedures that you would adopt to ensure that the results obtained were accurate, presented in appropriate units and as reliable as possible with the apparatus at your disposal.

Indicate briefly how you would present the data that you would obtain and how you would analyse them to draw your conclusions.

[16]