

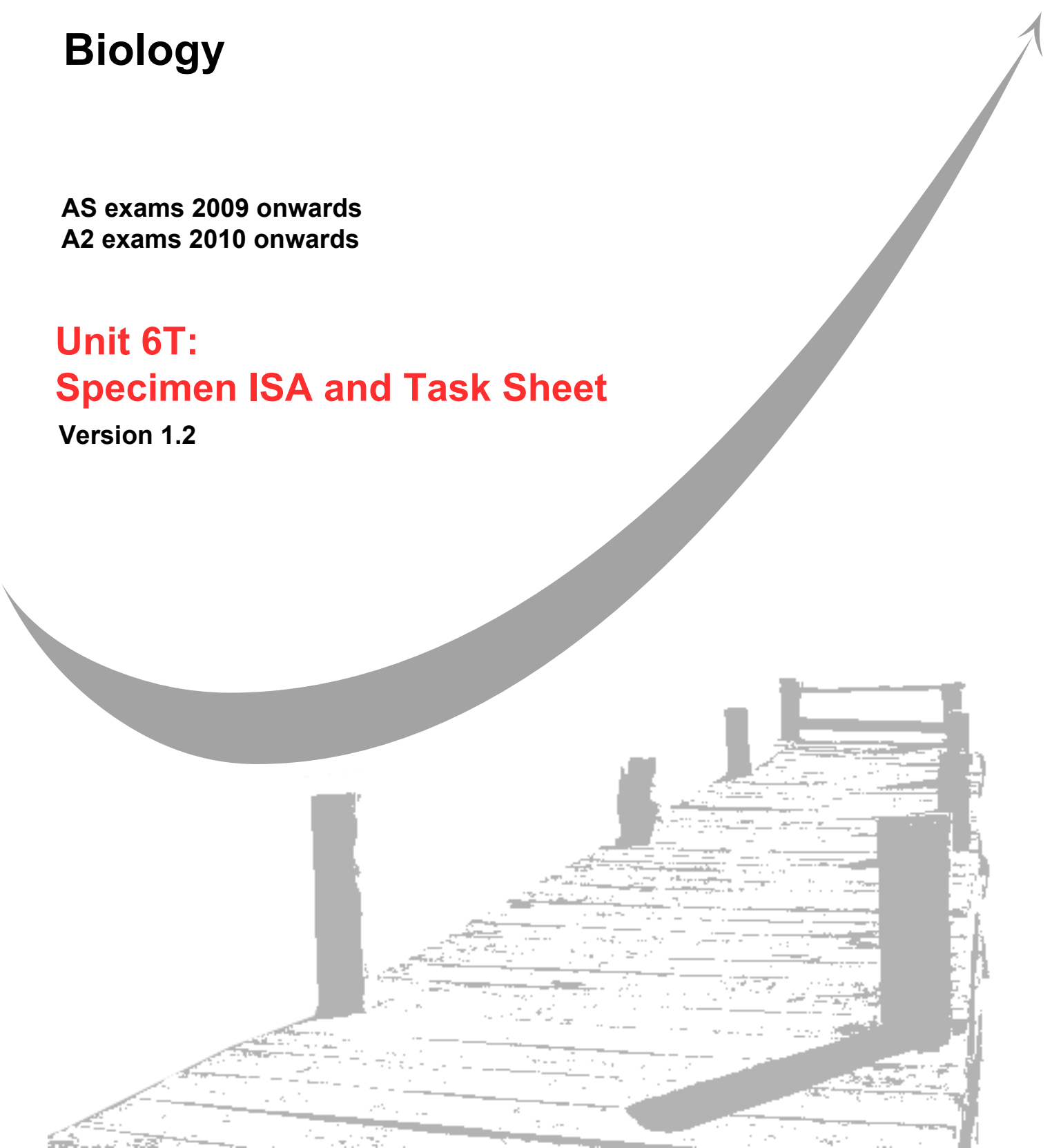
**GCE**  
**AS and A Level**

# **Biology**

**AS exams 2009 onwards**  
**A2 exams 2010 onwards**

## **Unit 6T:** **Specimen ISA and Task Sheet**

**Version 1.2**



Surname						Other Names					
Centre Number						Candidate Number					
Candidate Signature											

General Certificate of Education  
Advanced Level Examination



**BIOLOGY**  
**Investigative Skills Assignment (ISA)**  
**A2 Centre Assessed Unit**

**BIO6T**

Draft Specimen Paper  
To be conducted between 1 September 2008 and 1 May 2009  
For submission in May 2009

**In addition to this paper you will require**

- the task sheet, your results and statistical calculations
- a ruler with millimetre measurements

You may use a calculator.

For Teacher's Use	
	Mark
<b>Stage 1/2 skills</b>	
<b>Section A</b>	
<b>Section B</b>	
<b>TOTAL</b>	

Time allowed: 1 hour 15 minutes

**Instructions**

- Use black ink or ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- Answer the questions in the spaces provided.
- Do all rough work in this book. Cross through any work you do not want marked

**Information**

- The maximum mark for this paper is 44.
- The marks for questions are shown in brackets.
- You are reminded of the need for good English and clear presentation in your answers.
- Use accurate scientific terminology in all answers.

Signature of Teacher marking this ISA..... Date.....

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## SECTION A

These questions are about your investigation on the effect of aspect on the abundance of an organism growing on the bark of trees.

You should use the task sheet, your results and the statistical calculations you have carried out to answer these questions.

Answer **all** questions in the space provided.

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Name of the organism that you studied .....

**1** Describe how you measured the abundance of the organism you studied.

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.....  
.....  
.....

*(2 marks)*

**2** From how many trees did you collect data?

With reference to your data explain why you chose to collect data from this number of trees.

Number of trees .....

Explanation .....

.....  
.....  
.....

*(2 marks)*

**3** Give **two** ways in which you ensured that the data you collected for each tree was comparable.

1 .....

2 .....

*(2 marks)*

4 Explain **two** ways in which variation in the bark could account for variation in abundance of the organism that you studied.

1 .....

.....

.....

.....

2 .....

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.....

.....

*(4 mark)*

5 (a) Other than differences in the bark, name **two** factors which could have influenced the abundance of the organism you studied on the south and north sides of the trees.

1 .....

2 .....

*(2 marks)*

(b) Explain how **one** of these factors would influence the abundance of the organism.

Factor .....

Explanation .....

.....

*(1 mark)*

6 The number of quadrats you used may have affected the reliability of the data you collected. Explain **one** other way in which the method you used might have affected the reliability of the data you collected.

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*(2 marks)*

**Total 15**

## SECTION B RESOURCE SHEET

### Growing dumbcane as a house plant

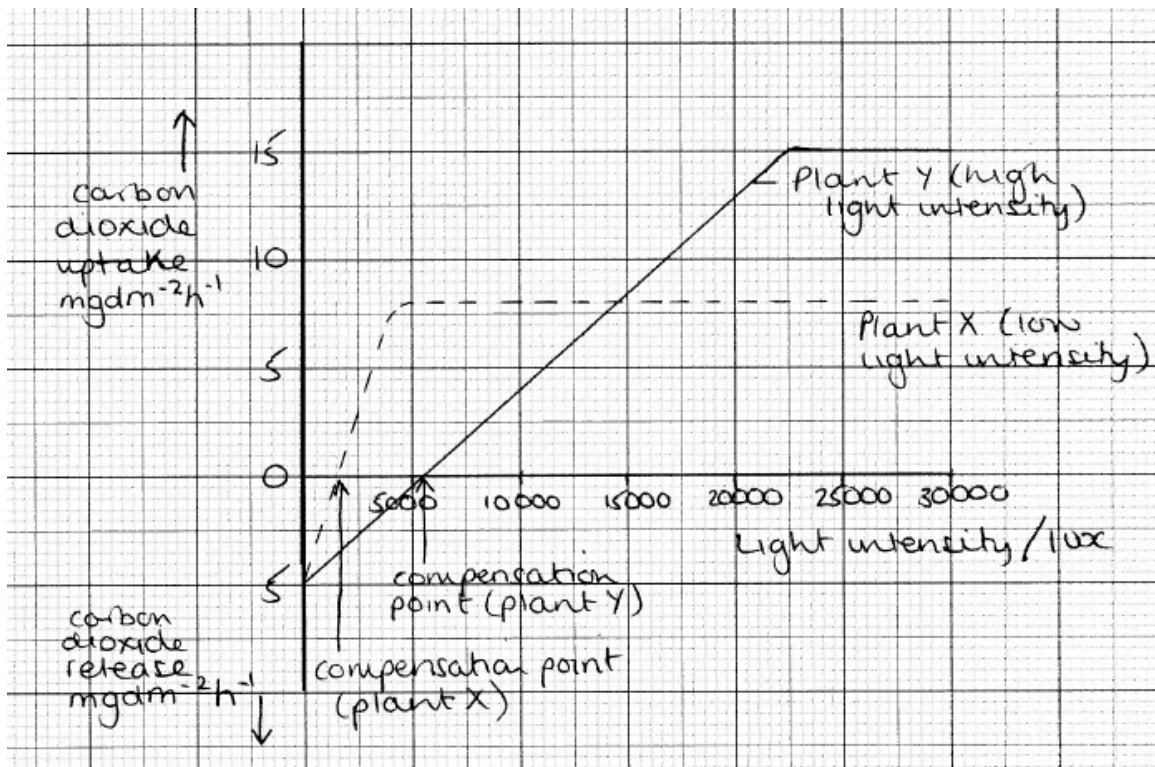
Dumbcane is a plant grown for its attractive leaves.

#### Resource A

The effect of light intensity on the rate of photosynthesis in two dumbcane plants.

Plant X had been growing at low light intensity (500 lux).

Plant Y had been grown at high light intensity (50 000 lux).



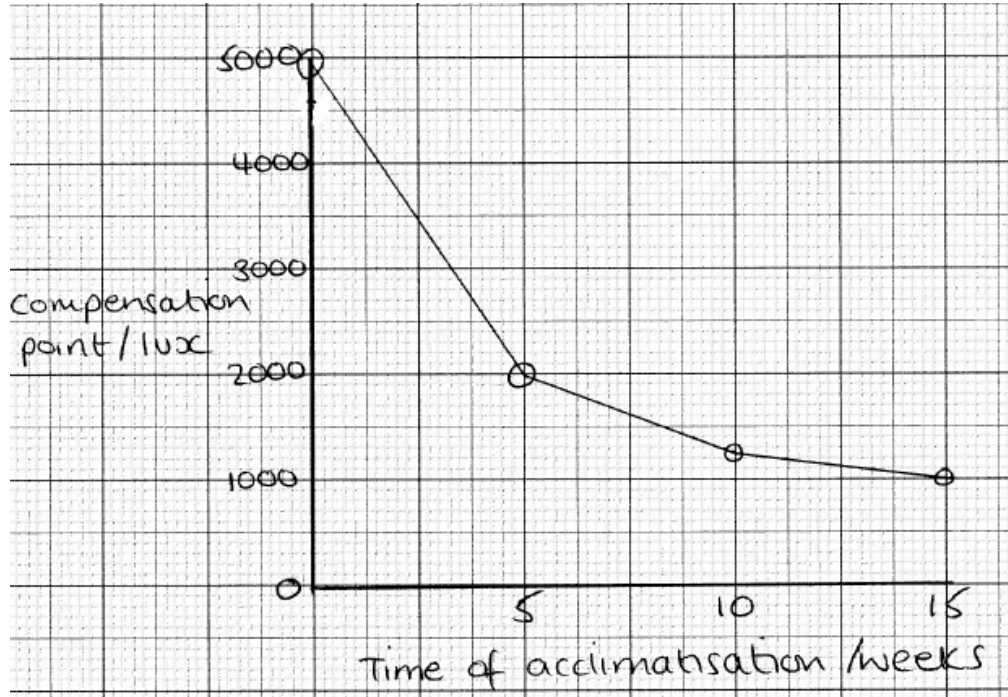
The compensation point is the light intensity when

Carbon dioxide production by respiration = Carbon dioxide uptake by photosynthesis

## Resource B

Dumbcane plants are usually grown in very bright light. They are kept in a low light intensity for several weeks before sale. Keeping the plants in a low light intensity is called **acclimatisation**.

The effect of acclimatisation on the compensation point of a dumbcane a plant



## Resource C

Leaf thickness of dumbcane plants grown in low light intensity (500 lux) and high light intensity (50 000 lux) were compared by measuring the dry mass of leaf discs. The table gives information about the dry mass of discs taken from different leaves of dumbcane plants grown in different light intensities. All leaf discs were the same diameter.

Light intensity	Number of discs	Mean dry mass / mg	Standard deviation
500	30	22	7
50 000	30	28	8

## Resource D

Method of production of a chlorophyll solution from leaves

- cut leaf discs from fresh leaves
- grind discs in ethanol with a little sand
- separate cell wall debris from chlorophyll solution

**SECTION B**

Use the information in the resource sheet on the dumbcane plants to answer the questions.

Answer **all** questions in the spaces provided.

Use **Resource A** to answer these questions.

- 7 (a) The rate of photosynthesis in plant **Y** changes with increasing light intensity. Describe how.

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.....  
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*(2 marks)*

- (b) The effect of light intensity on the rate of photosynthesis of plant **Y** differed from the effect on the rate of photosynthesis on plant **X**. Describe how.

.....  
.....

*(1 mark)*

- 8 What is the compensation point of plant **X**?

.....  
.....

*(1 mark)*

- 9 Indoor light intensities are about 1000 lux.

- (a) Dumbcane plants grown in high light intensities are acclimatised before they are sold as house plants. Use the material in the **Resources** to explain why.

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.....  
.....  
.....

*(2 marks)*



(b) Giving a reason for your answer, suggest the length of time dumbcane plants should be acclimatised before sale

to benefit the buyer

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to benefit the grower.

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.....

.....

*(4 marks)*

**10** The data in **Resource C** were collected by a student.

(a) Dry mass can be used as a measure of leaf thickness. Explain why.

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*(2 marks)*

(b) The student concluded that there was a significant difference in the mean dry mass of leaf discs from plants grown in low light intensity and the leaf discs from plants grown in high light intensity. Do you agree with this conclusion? Use an appropriate statistical test to support your answer. You may use the statistics data sheet to help.

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*(4 marks)*



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**Factors affecting the growth of photosynthetic organisms**

**INTRODUCTION**

You are required to investigate the abundance of one organism that grows on the bark of trees. You should investigate its abundance on the north facing side and the south facing side.

Your teacher will tell you which organism you will be investigating.

Name of organism.....

In the investigation you should collect reliable quantitative data measured to an appropriate level of accuracy.

You should decide what statistical test you intend to use.

You should then collect data that can be analysed statistically.

When collecting data you should decide for yourself

- what measurements to make
- how to select your samples
- how many quadrats to take
- the relevant factors you will need to control or monitor

In the next stage you will analyse your results with a suitable statistical test.