



Rewarding Learning

General Certificate of Secondary Education
2011–2012

Centre Number

71	
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Candidate Number

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Science: Single Award (Modular)

Staying Alive
Module 1

Higher Tier

[GSC12]



TUESDAY 15 MAY 2012, MORNING

TIME

45 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

Write your answers in the spaces provided in this question paper.

Answer **all six** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 45.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	

Total Marks	
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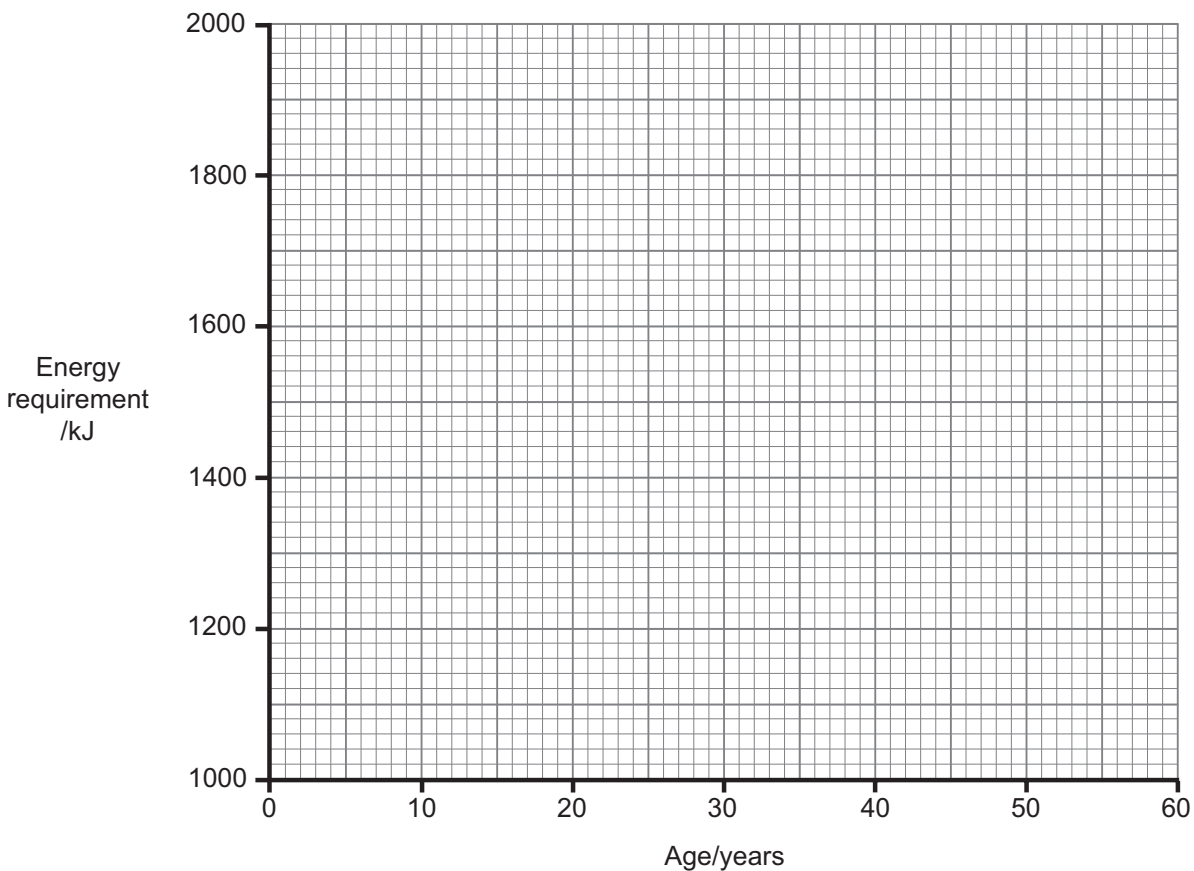


1 The table below shows the energy requirements for people of various ages at three different levels of physical activity.

Examiner Only	
Marks	Remark

Energy/kJ Age/years	Activity Levels		
	Low	Medium	High
8	1200	1400	1800
13	1500	1600	2200
18	1800	2000	2400
30	2000	2200	2400
50	1800	2000	2200
60	1600	1800	2000

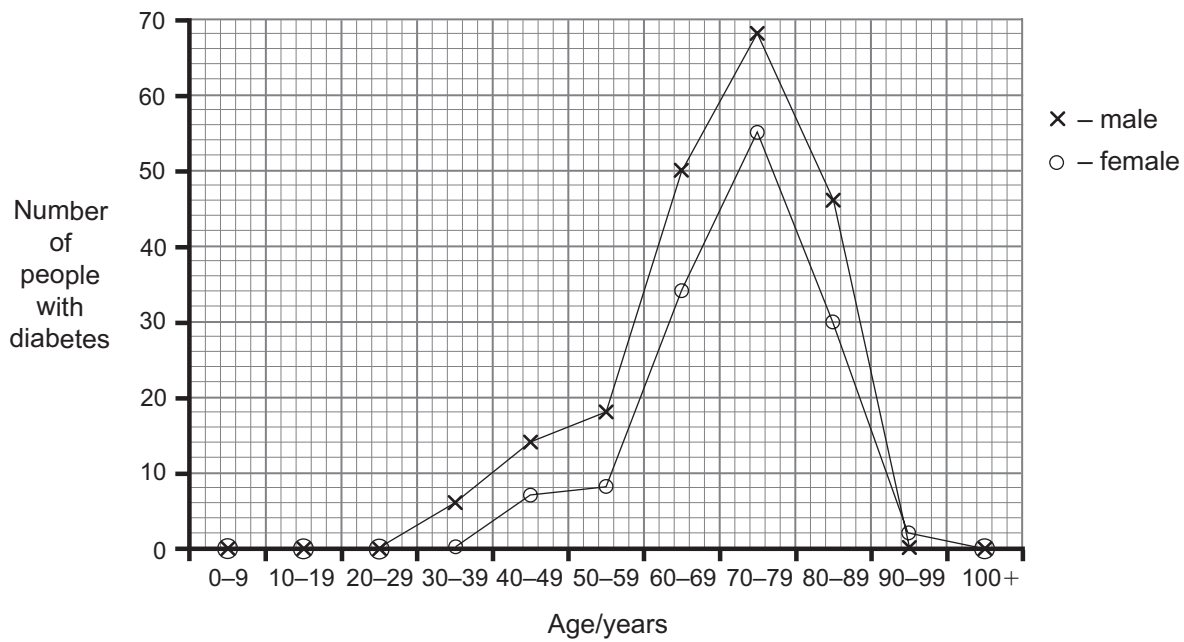
(a) Plot and draw a line graph on the grid below of the energy requirement for people with **low** activity levels. [3]



2 (a) Explain fully how a person suffering from 'compulsive eating disorder' may become obese.

[3]

(b) The graph below shows the number of people with diabetes registered with one doctor in Belfast.



Examiner Only	
Marks	Remark

- (i) All these patients have type 2 diabetes. State **one** piece of evidence from the graph that shows this.

_____ [1]

- (ii) Calculate the number of males registered with diabetes.

Show your working.

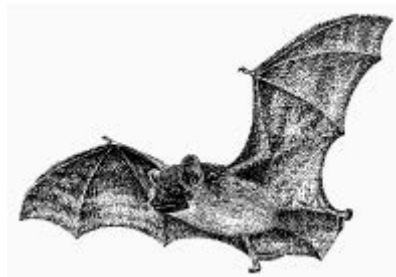
Answer _____ [2]

- (iii) Give a reason why it would not be valid to deduce from this data that more males suffer from diabetes than females.

_____ [1]

Examiner Only	
Marks	Remark

- 3 (a) The diagram shows a pipistrelle bat which, like a human, is a mammal.



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Pipistrelle bats hibernate (sleep) during the winter and only waken occasionally to get rid of excess water which is produced in their cells. Prior to hibernation they eat a lot in order to have a food store in their body cells.

Explain fully how this excess water is **produced** by the bat's body.

[4]

Examiner Only	
Marks	Remark

(b) Long ears in bats is dominant to short ears.

Let **(E)** represent the allele for long ears and **(e)** represent the allele for short ears.

(i) Draw a genetic diagram below to show how two long eared parents can have short eared offspring.

[3]

(ii) What is the expected ratio of short eared bats to long eared in these offspring?

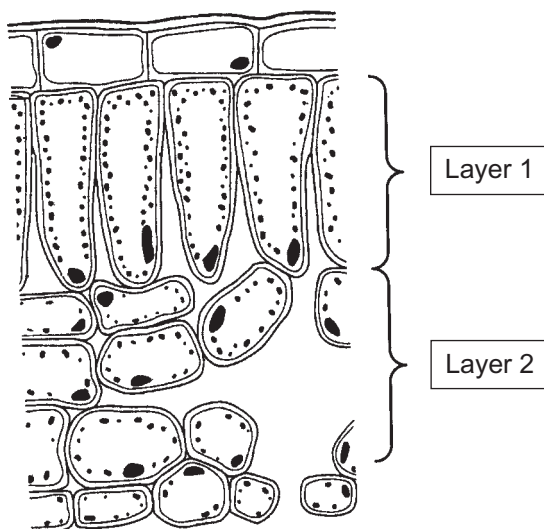
_____ [1]

Examiner Only	
Marks	Remark

4 (a) Describe the method for an experiment to show that chlorophyll is needed for photosynthesis.

[4]

(b) The diagram below shows an outline of the cell layers in a leaf.



lower side of leaf

© GCSE Biology for CCEA by R McIlwaine & J Napier, published by Hodder & Stoughton, 2003. ISBN 0340858257. "Reproduced by permission of Hodder Education"

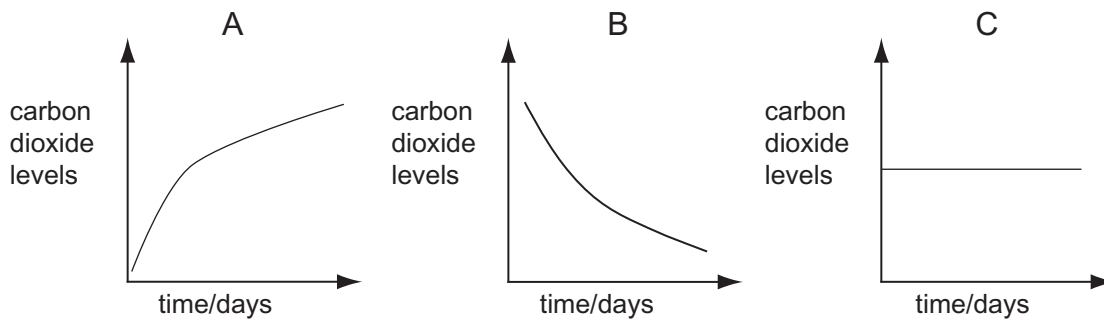
In which layer (1 or 2) will there be the higher rate of photosynthesis?

Explain your choice.

[3]

Examiner Only	
Marks	Remark

(c) Plants are put into a new greenhouse and the amount of carbon dioxide is monitored for fourteen days.



Which graph shows the result you would expect over the 14 day period? Explain your answer.

[2]

Examiner Only	
Marks	Remark

- 5 (a) Different processes have been used to identify the arrangement of bases in DNA. Two of these are quantitative analysis and modelling. For each process state the names of the scientist(s) who used them and describe the evidence they produced.

Quantitative analysis _____

Modelling _____

_____ [4]

- (b) What is meant by the 'base triplet hypothesis'?

_____ [2]

Examiner Only

Marks

Remark

6 The picture below shows GM sunflowers.



© Tom Stoddart / Hulton Archive / Getty Images

The following statements (1–6) contain information about GM crops.

1. GM crops might breed naturally with wild plants.
2. Insect-resistant crops reduce the total use of pesticides.
3. GM crops have added nutritional values e.g. vitamins.
4. The long-term effects of eating GM crops are unknown.
5. Seeds for GM crops are more expensive than for conventional crops.
6. GM crops can provide sufficient yields despite a poor weather season.

Using the numbers (1–6) choose **two** statements (for each of **A** and **B**) which cause:

A many farmers to be in favour of growing GM crops and give reasons for your choices.

[4]

B some people to be against the growing of GM crops and give reasons for your choices.

[4]

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Marks	Remark

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