



Rewarding Learning

General Certificate of Secondary Education  
2013

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Candidate Number

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## Biology

Unit 2

Higher Tier

[GBY22]



\*GBY22\*

TUESDAY 18 JUNE, MORNING

### TIME

1 hour 45 minutes.

### INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided. **You must answer the questions in the spaces provided. Do not write outside the box, around each page or on blank pages.** Complete in blue or black ink only. **Do not write with a gel pen.** Answer **all thirteen** questions.

### INFORMATION FOR CANDIDATES

The total mark for this paper is 115. Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question. Quality of written communication will be assessed in questions **4, 8(c)** and **13(c)**.





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- 2 (a) A ban on smoking in workplaces came into effect in the Republic of Ireland in 2004.

Bar staff completed a health questionnaire about their symptoms, before the ban and three years after the ban.

The table shows the results of the questionnaires.

Symptom	Percentage of bar staff complaining of symptoms	
	Before ban	3 years after ban
Eye irritation	82	51
Sneezing	75	34
Coughing	87	67

*Adapted from: Respiratory health improvement continues after workplace smoking ban in Ireland by Michele Agnew, Patrick Goodman, Luke Clancy: Reproduced by permission of the European Respiratory Society Eur Respir J October 2008; 32, Suppl. 32: 259s (Abstract 1577) © European Respiratory Society*

- (i) Suggest **one** conclusion that can be made from the results of the questionnaires about the health of bar staff.

Use data from the table to support your conclusion.

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[2]

- (ii) Which symptom shows the greatest change after the ban?

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[1]

Examiner Only	
Marks	Remark







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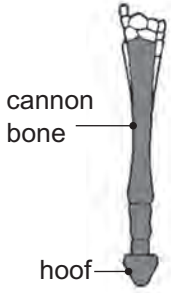
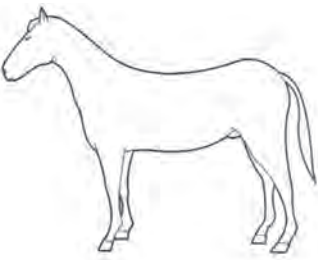

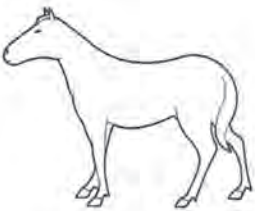










5 The table shows some information, from fossil records, about the evolution of the horse.

Examiner Only	
Marks	Remark

Millions of years ago	Lower leg bones	Body	Height/m
1	 <p>cannon bone</p> <p>hoof</p>		1.6
10			1.0
40			0.6
60	 <p>toe</p>		0.4









- 7 The table shows the results of an experiment carried out to investigate the effect of placing potato cylinders into a range of sugar solutions kept at the same temperature for 24 hours.  
All the potato cylinders were taken from the same potato.

Concentration of sugar solution/M	Initial mass of potato cylinder/g	Final mass of potato cylinder/g	Change in mass of potato cylinder/g	Percentage change in mass of potato cylinder
0.0	4.00	4.80	+0.80	+20.0
0.2	4.28	4.75	+0.47	
0.4	3.95	4.03	+0.08	+2.0
0.6	4.00	3.72	-0.28	-7.0
0.9	4.20	3.36	-0.84	-20.0

- (a) Use the information given to suggest **two** ways the experiment was a fair test.

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[2]

- (b) Complete the table by calculating the percentage change in mass of the potato cylinder placed in 0.2 M solution.  
Show your working.

[2]

Examiner Only	
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- 8 The table shows the percentage of adults who have a high concentration of cholesterol in their blood.

Year	Percentage of adults who have a high concentration of cholesterol in their blood	
	Men	Women
1998	75	77
2005	58	61

Adapted from: [www.heartstats.org](http://www.heartstats.org)

- (a) Describe **one** trend shown in the table.

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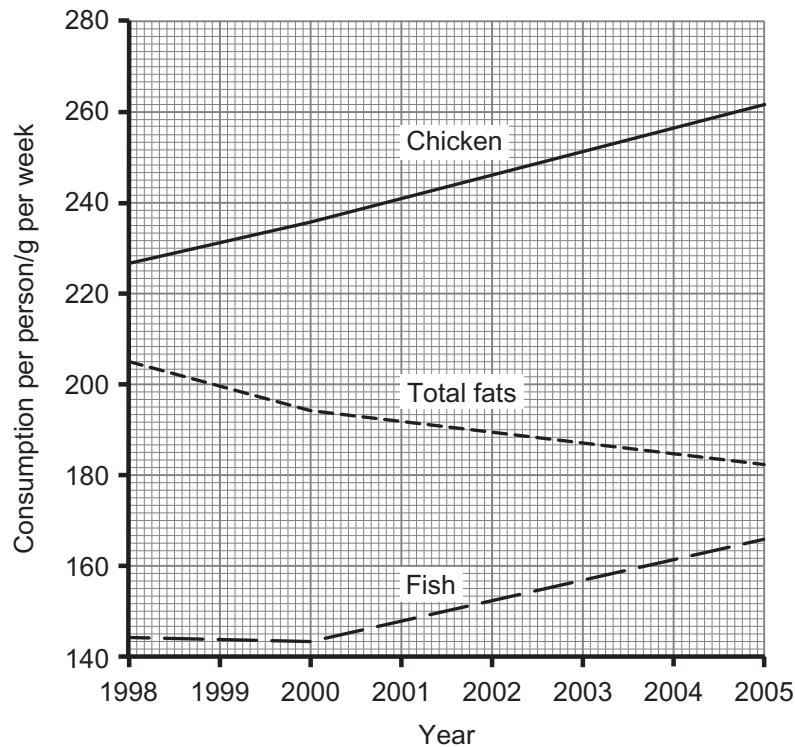
[1]

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Marks	Remark



One of the factors causing high cholesterol in blood is the fat in a person's diet.

The graph shows the consumption of fish, chicken and total fats between 1998 and 2005 by adults.



Source: [www.heartstats.org](http://www.heartstats.org)

(b) Use data from the graph and the table to help explain why the percentage of adults who have a high concentration of cholesterol in their blood has changed between 1998 and 2005.

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[4]

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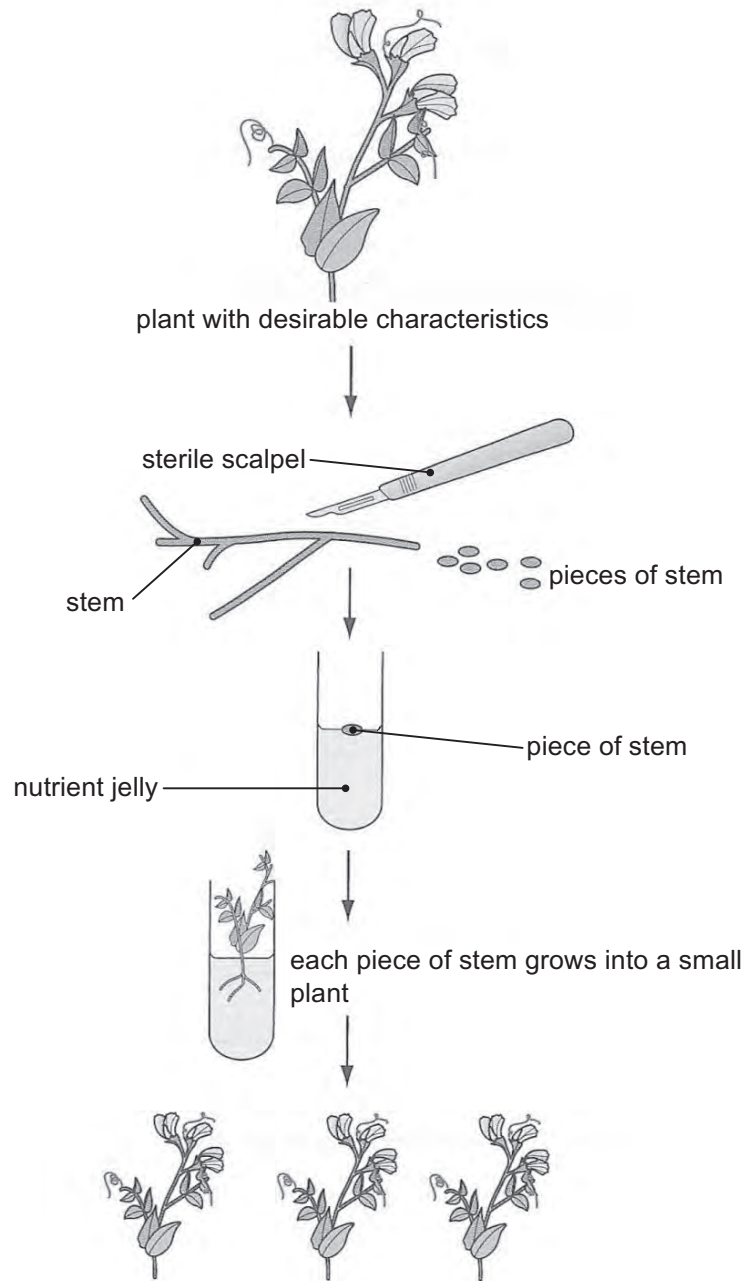








(b) The diagram shows some steps involved in cloning plants.



© Barking Dog Art

- (i) Suggest why the scalpel used to cut the pieces of plant stem must be sterile.

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\_\_\_\_\_ [1]

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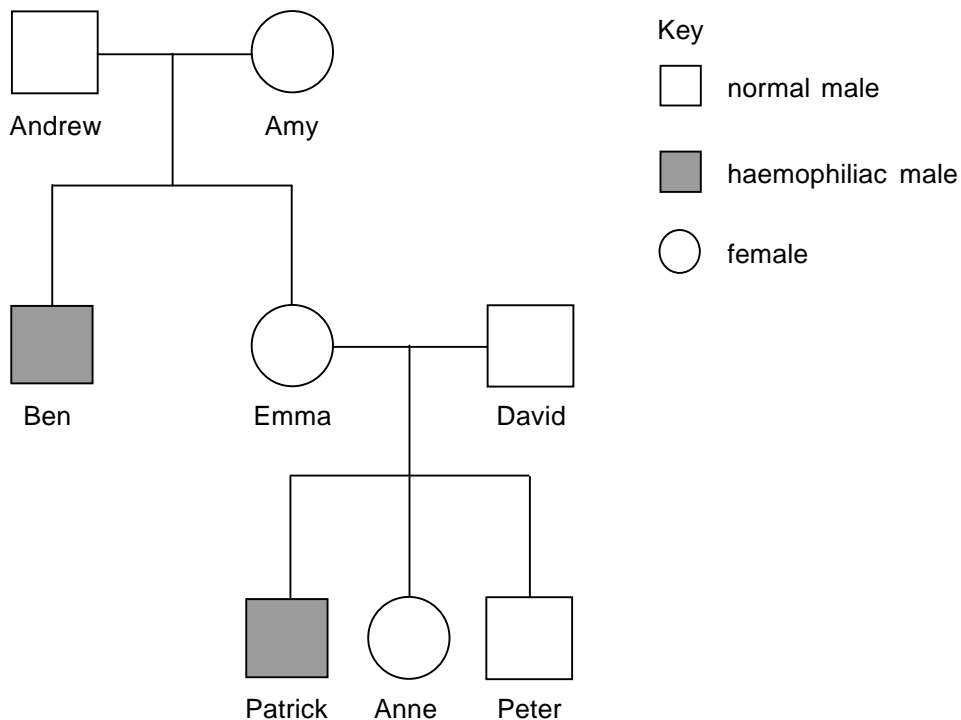


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11 Haemophilia is a recessive sex-linked inherited disorder.

The diagram shows a family tree.



Use the following symbols to help answer the questions.

$X^H$  for the normal allele.

$X^h$  for the recessive haemophiliac allele.

(a) Use evidence from the diagram to explain why Amy must be a carrier of haemophilia.

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[2]

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Marks	Remark











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(d) The results of research into the percentage of each of the bases present in the DNA of five people are shown in the table.

Person	Percentage of base in DNA			
	A	T	G	C
1	30.9	29.7	19.9	20.1
2	28.9	29.8	22.4	19.5
3	29.2	29.6	19.1	21.3
4	29.7	30.1	21.2	21.0
5	28.3	29.3	20.4	19.6
Average	29.4	29.7	20.6	

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(i) **Complete the table** by calculating the average percentage of the base C. [1]

(ii) Suggest why the results for each base are considered to be reliable.

\_\_\_\_\_ [1]

(iii) What **two conclusions** can be made from these results about the percentage of the bases present in these samples of DNA?

1. \_\_\_\_\_ [1]

2. \_\_\_\_\_ [1]

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<b>Total Marks</b>	
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