



General Certificate of Secondary Education
2010–2011

Science: Single Award (Modular)

Human Activity and Health
Module 2

Higher Tier

[GSC22]



THURSDAY 11 NOVEMBER 2010, AFTERNOON

Centre Number

71

Candidate Number

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



1 (a) MMR is a combined vaccination that protects against mumps, measles and rubella. In 1998 it was reported that there could be a link between taking the MMR vaccination and developing autism.

(i) Suggest how this reported link affected the number of children being vaccinated with MMR in 1998.

_____ [1]

(ii) Suggest how this affected the number of children catching measles in the years following 1998.

_____ [1]

(iii) The number of children being vaccinated now for MMR has returned to pre-1998 levels. Suggest why this has happened.

_____ [1]

(b) Sasha had a throat infection and was feeling very unwell. Her doctor was sure it was caused by some type of bacteria and prescribed an antibiotic.

(i) Give **two** reasons why she was prescribed an antibiotic and not a vaccination.

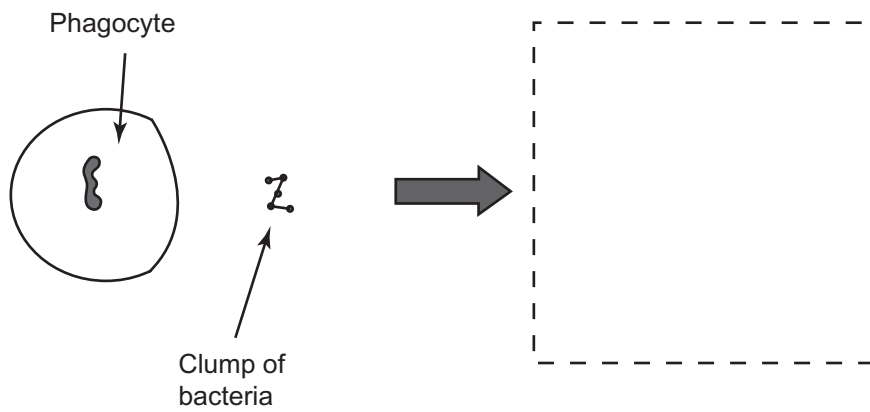
_____ [2]

(ii) Suggest why it is important that antibiotics are not overused.

_____ [1]

Examiner Only	
Marks	Remark

(c) The diagram shows a phagocyte (type of white blood cell) and a clump of bacteria.



(i) Complete the diagram above to show what happens next. [1]

(ii) Name the process shown.

_____ [1]

Examiner Only	
Marks	Remark

- 3 (a) The population of Northern Ireland has risen to almost 1.8 million, mainly because people are living longer.

Give **two** reasons why people are living longer.

1. _____ [1]

2. _____ [1]

- (b) Larger population sizes require greater efficiency in food production. One way of developing greater efficiency in farming is to add antibiotics to the food of intensively farmed livestock.

- (i) Explain fully how the addition of antibiotics can increase yield.

_____ [2]

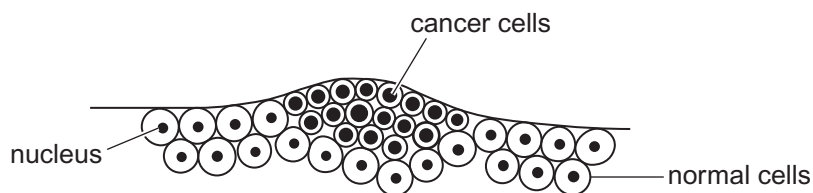
- (ii) Give **two** reasons why the routine addition of antibiotics to the food of livestock has been banned in many countries.

_____ [2]

Examiner Only

Marks Remark

- 4 (a) The following diagram represents skin cancer, a condition which affects many people in Northern Ireland.



- (i) Use the diagram to give **two** ways in which the cancer cells are different from normal cells.

_____ [2]

- (ii) Explain how some skin cells become cancerous.

_____ [3]

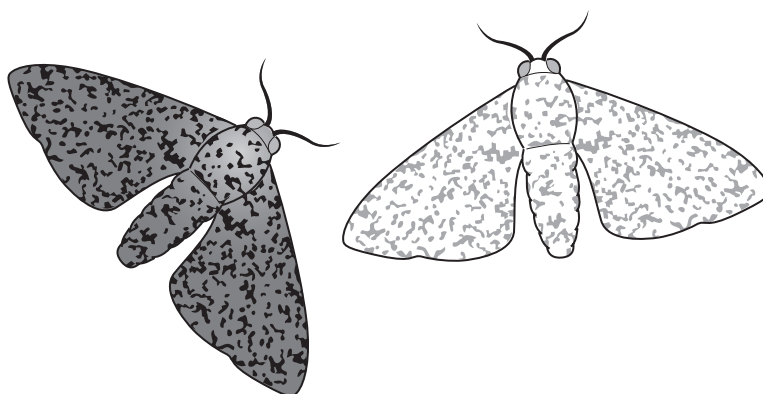
- (b) Explain why someone travelling to Asia for the first time needs to take a number of **new** vaccinations before travelling.

_____ [2]

Examiner Only	
Marks	Remark

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(Questions continue overleaf)

- 5 (a) There are two genetically different varieties of peppered moth; light and dark forms as seen in the following diagram. Both rest on tree trunks and are a favourite food for birds.



The following table shows how the percentage of dark moths changed between 1800 and 1900.

- (i) Complete the table by calculating the percentage for the light variety.

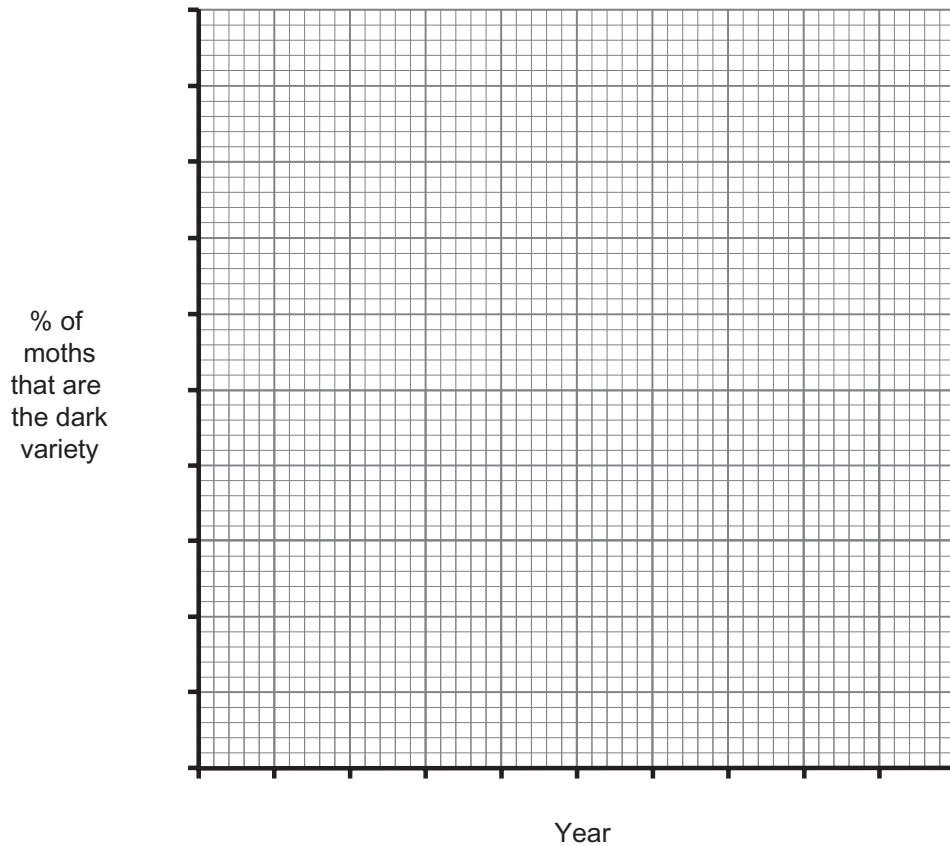
	% moths	
Year	Dark variety	Light variety
1800	2	
1825	5	
1850	5	
1875	55	
1900	95	

[1]

Examiner Only

Marks Remark

- (ii) On the grid below scale the axes, plot and draw a line graph of the percentage of moths that are **dark coloured** from 1800–1900.



[3]

Between 1800 and 1900 the tree trunks became darker due to smoke (soot) pollution.

- (iii) Describe and explain the change in the number of **light coloured** moths during this time.

[3]

Examiner Only	
Marks	Remark

(b) Artificial selection has been used to produce the wheat shown below.



In a field of modern wheat all the stems are of a similar height and the heads contain many seeds.
© Ingram Publishing/SuperStock'

Using wheat as an example, describe the process of artificial selection and explain its advantage to farmers.

_____ [3]

(c) Name the scientist who proposed the theory of evolution.

_____ [1]

Examiner Only	
Marks	Remark

- 6 (a) Nature reserves are areas often designated with the specific purpose of maintaining or enriching biodiversity (the range of plant and animal species present).

Some nature reserves are open to the public and in others public access is not permitted.

Recent research has suggested that in some nature reserves, allowing public access to the reserve has resulted in a decrease of biodiversity.

- (i) Suggest **one** way that public access can lead to a reduction of biodiversity.

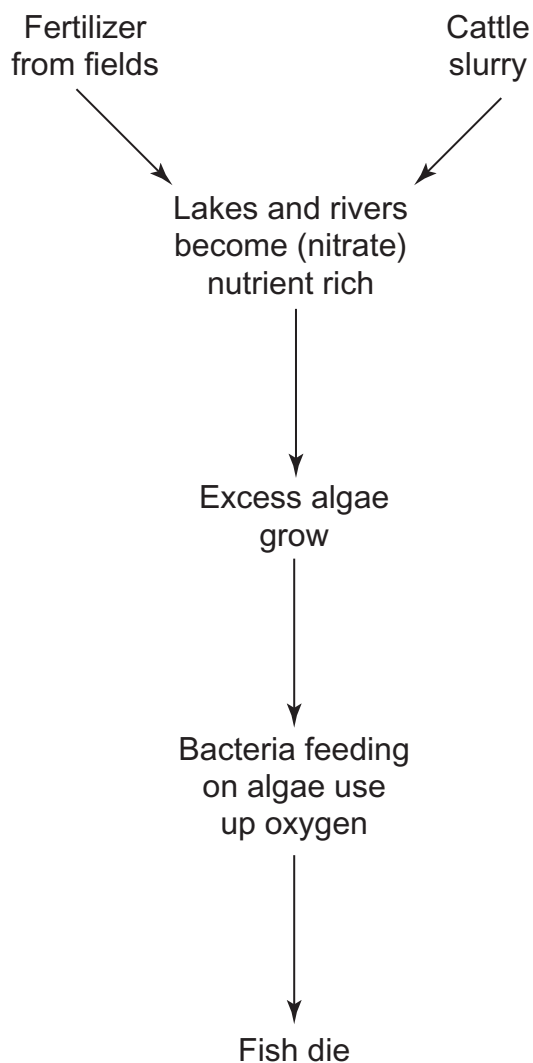
_____ [1]

- (ii) Plan an investigation to check if public access does affect biodiversity in a nature reserve.

_____ [3]

Examiner Only	
Marks	Remark

(b) The diagram below shows how nitrates entering waterways can lead to water pollution and the death of fish.



Use the diagram and your knowledge to explain how the European Nitrates Directive helps reduce water pollution.

[3]

Examiner Only	
Marks	Remark

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