Rewarding Learning

Centre Number

Candidate Number

General Certificate of Secondary Education
2017–2018

Science: Single Award

Unit 1 (Biology)

Foundation Tier

MV18

[GSS11]

TUESDAY 15 MAY 2018, AFTERNOON

Time

1 hour, plus your additional time allowance.

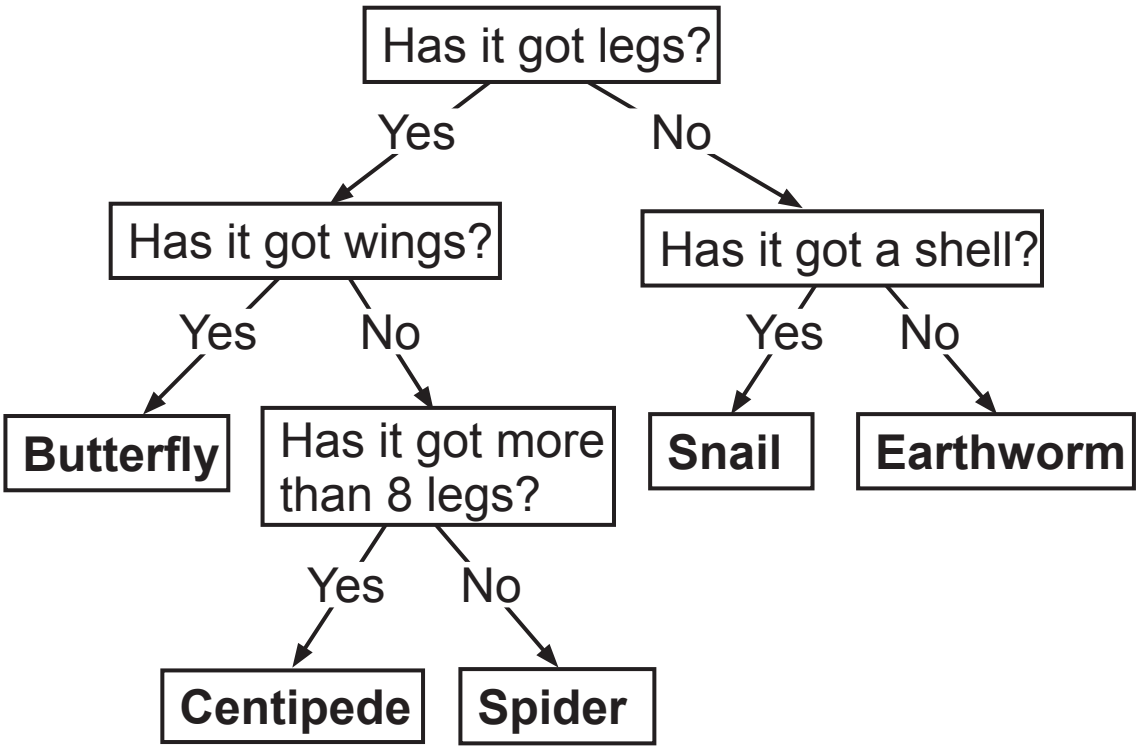
Instructions to Candidates

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
You must answer the questions in the spaces provided.
Do not write on blank pages.
Complete in black ink only.
Answer **all nine** questions.

Information for Candidates

The total mark for this paper is 60.
Figures in brackets printed at the end of each question indicate the marks awarded to each question or part question.
Quality of written communication will be assessed in Question **9**.

1 **(a)** Shown below is a key that can be used to identify some animals.



(i) How many animals can this key be used to identify? [1 mark]

_____

(ii) Use the key to identify the animal shown below. [1 mark]

_____

(iii) Use information from the key to give **two** features of a snail. [2 marks]

1. _____

2. _____

(b) Suggest **one** reason why scientists classify animals. [1 mark]

_____

_____

2 The statements in the table below describe either the nervous or hormone system.

(a) Place a tick (✓) beside each statement to show if it describes the nervous system or the hormone system. The first one has been done for you. [2 marks]

Statements	**Nervous system**	**Hormone system**
message is slow		✓
message travels along neurones		
message travels in the blood		
message is electrical		
message is chemical		

(b) Insulin is a hormone that controls blood glucose levels. Type 1 diabetes occurs when an organ in the body stops producing insulin.

(i) Name the organ in the body that produces insulin.

Circle the correct answer. [1 mark]

liver **pancreas** **kidney**

(ii) Give **two** possible long-term effects of diabetes. [2 marks]

1. _____

2. _____

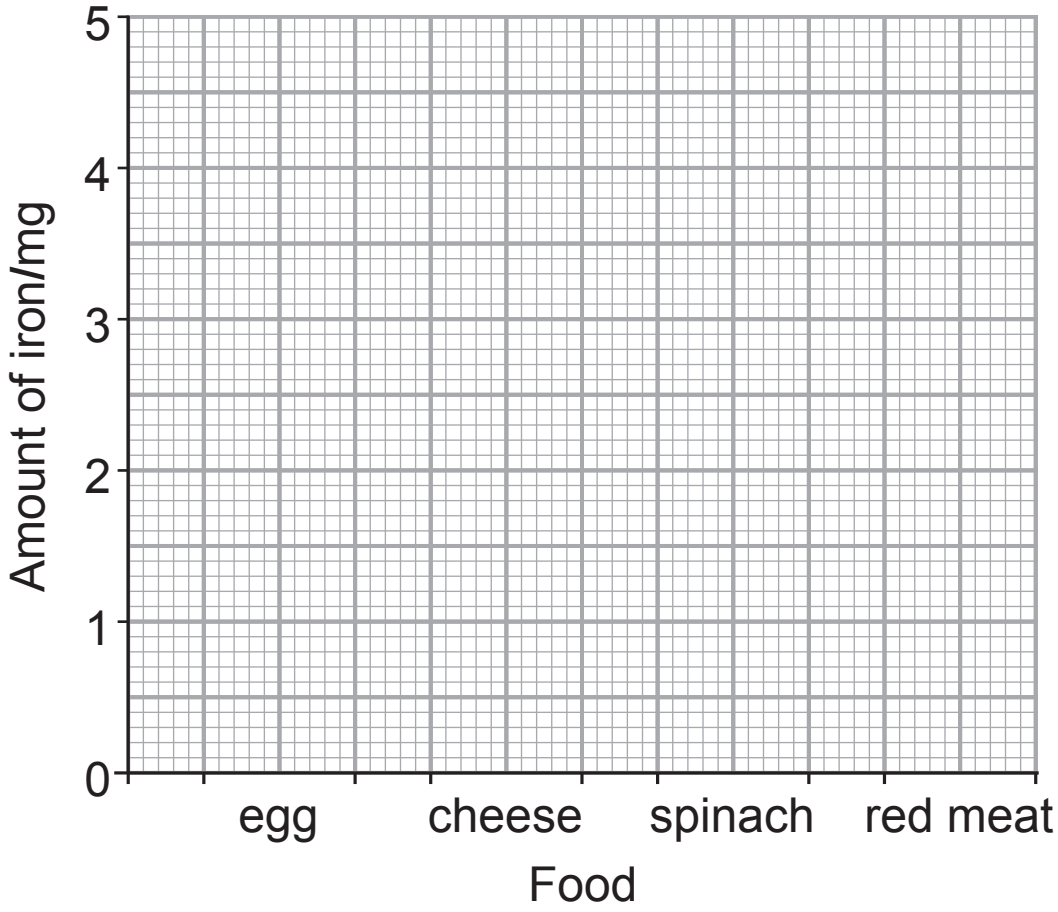
3 **(a)** Vitamins are needed to keep us healthy. Different vitamins are found in different foods.
Using lines, link each vitamin to **one** food that is a good source of that vitamin. [2 marks]

Vitamin	**Food Source**
	oily fish
vitamin C	
	oranges
vitamin D	
	rice

A healthy diet should also contain minerals. The table below shows the amount of the minerals iron and calcium in 100 g of four different foods.

Food	Iron/mg	Calcium/mg
egg	2.0	50
cheese	0.4	200
spinach	4.0	240
red meat	4.3	15

(b) On the grid below draw a **bar graph** for the iron content in these foods. [2 marks]



(c) A doctor has advised James that his iron level is low. From the table, name the food which would be best for increasing his iron level. [1 mark]

_____

(d) The recommended daily allowance (RDA) of **calcium** is 1000 mg.

(i) Using information from the table, calculate the percentage (**%**) of the RDA of calcium that is provided by 100 g of cheese.

(Show your working out.) [2 marks]

Answer _____ **%**

(ii) Give **one** function of calcium in the body. [1 mark]

_____

4 **(a)** Shown below is a simple food chain.

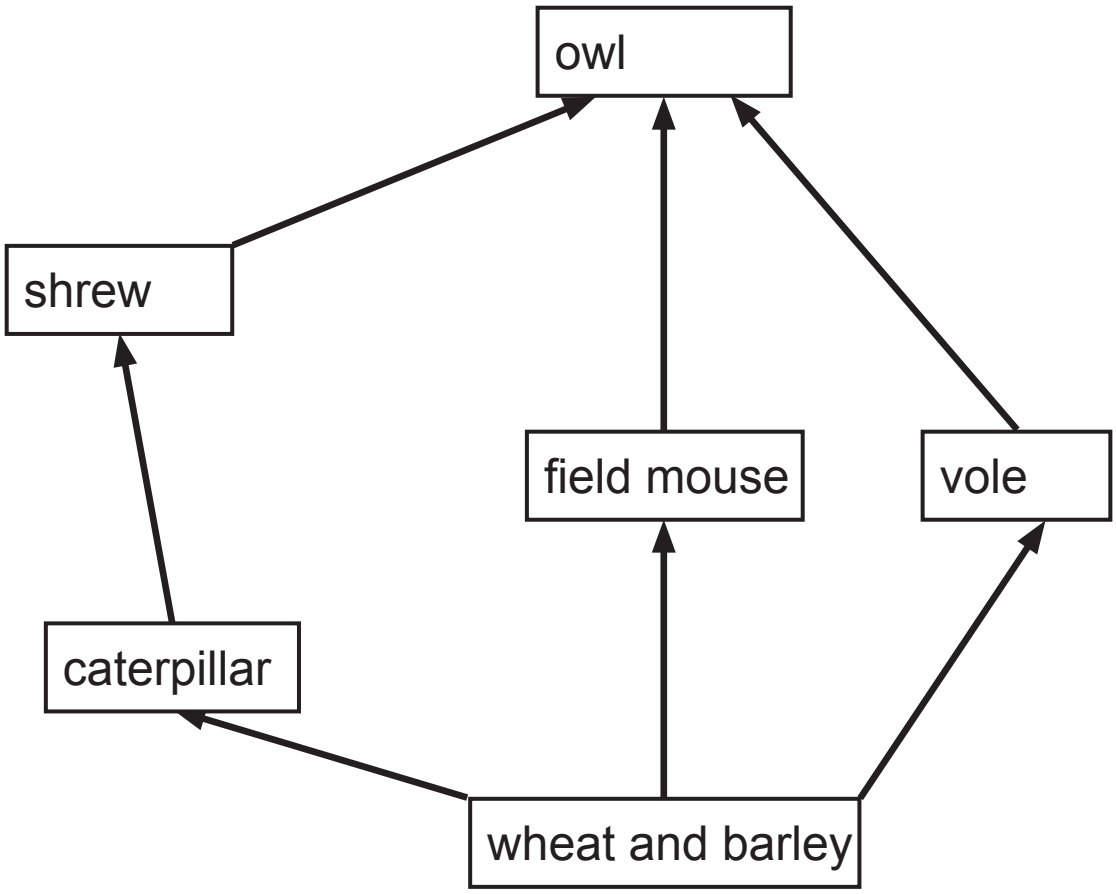
(i) What do the arrows show? [1 mark]

_____

(ii) Name the primary consumer in this food chain. [1 mark]

_____

(b) This food chain forms part of a food web as shown below.



(i) Suggest **one** advantage to the owl of being part of this larger food web. [1 mark]

(ii) Due to disease the number of shrews decreased. What effect, if any, would this have on the number of caterpillars? Explain your answer. [2 marks]

(c) Farmers who grow wheat and barley like to have owls nesting on their farms. Using information in the food web, and your knowledge, suggest why owls could help farmers make more money. [3 marks]

5 Shown below is a Manx cat. Some Manx cats have no tail.

The allele for no tail (T) is dominant to the allele for having a tail (t).
Manx cats with no tail have the genotype Tt.
Kittens with the genotype TT die in the uterus so there cannot be an adult cat with the genotype TT.

(a) (i) What is meant by the term **dominant**? [1 mark]

_____

_____

(ii) What term describes the genotype Tt, where each allele is different? [1 mark]

_____

(b) (i) Complete the Punnett square below showing the cross between a cat with no tail (Tt) and a cat with a tail. [2 marks]

	T	
	Tt	
t		

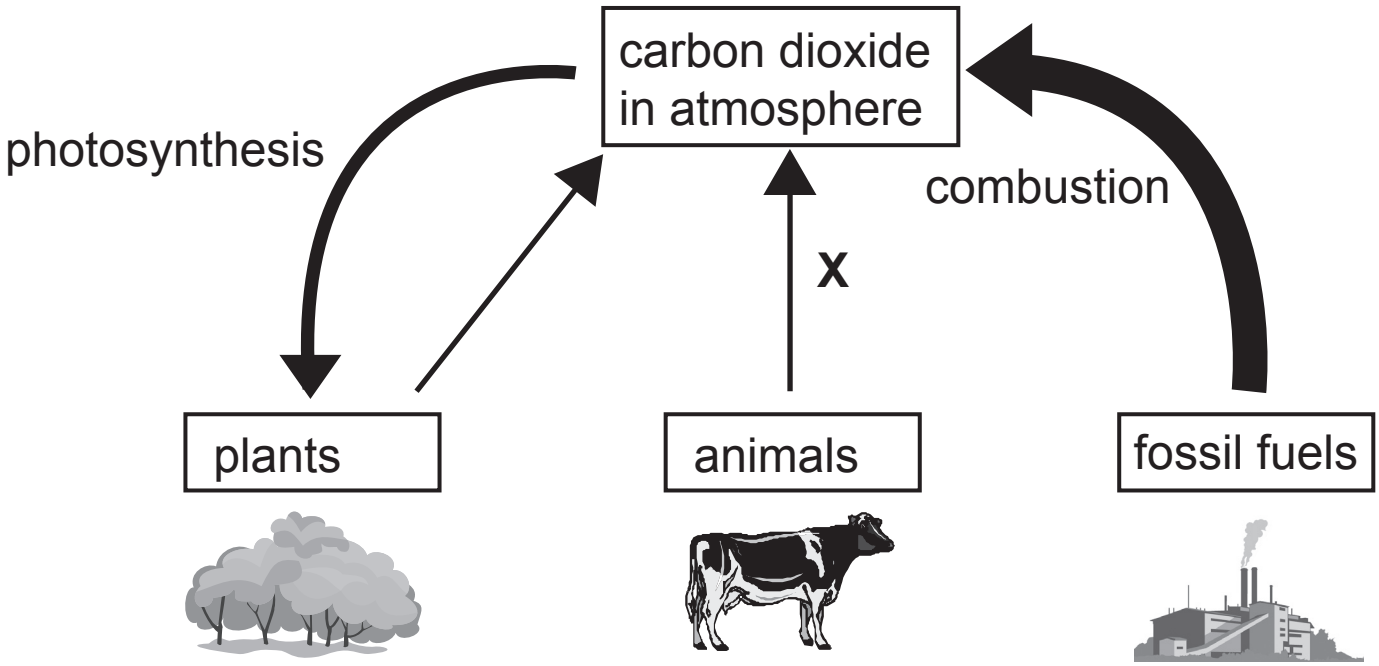
(ii) From your Punnett square, what is the chance of the kittens also having no tail?

Circle the correct answer. [1 mark]

100% **75%** **50%** **25%**

(c) Using the information given, explain fully why breeders do **not** usually cross two Manx cats with no tail (Tt). [2 marks]

6 The diagram below shows how carbon dioxide enters and leaves the atmosphere.
The arrows show the movement of carbon dioxide. The thicker the arrow the more carbon dioxide.



(a) Name the process labelled **X** on the diagram. [1 mark]

_____

(b) Using the diagram, explain why the amount of carbon dioxide in the atmosphere is increasing. [2 marks]

_____

_____

_____

_____

(c) The increasing amount of carbon dioxide in the atmosphere is leading to global warming.

(i) Explain what is meant by the term **global warming**. [1 mark]

_____

_____

(ii) Give **one** effect of global warming. [1 mark]

_____

(d) When the Earth was first formed approximately 4.5 billion years ago, its atmosphere contained more carbon dioxide and less oxygen than today.

However when green plants evolved the composition of the atmosphere began to change.

(i) What process takes place in green plants that helped change the amount of carbon dioxide and oxygen in the atmosphere and promoted the evolution of animals? [1 mark]

_____

(ii) In what way have the levels of carbon dioxide and oxygen in the atmosphere changed from the time green plants first evolved? [2 marks]

_____

_____

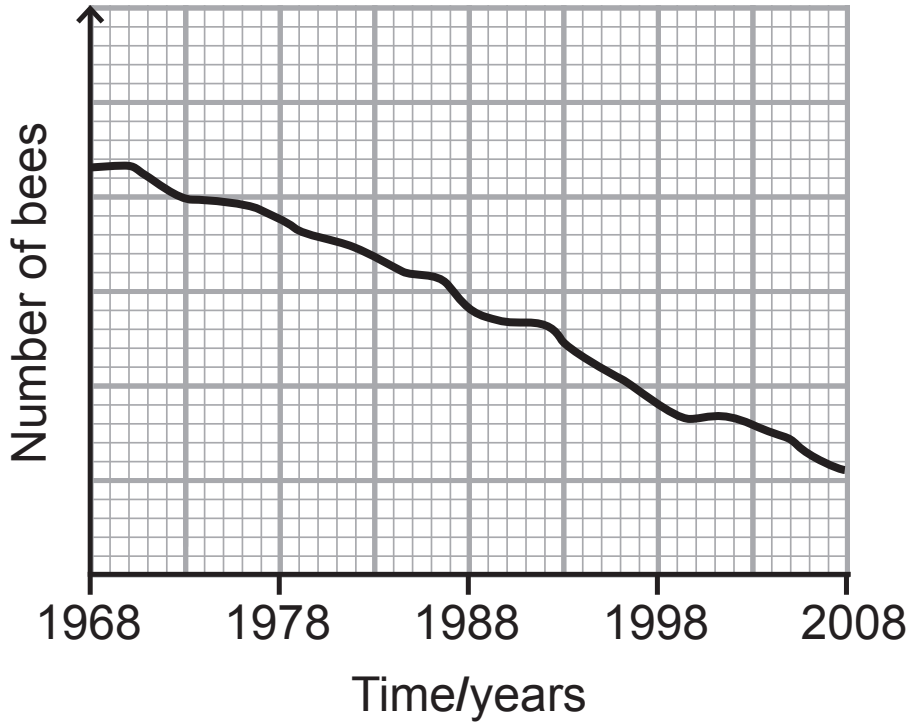
_____

7 Bees are important in the life cycle of plants. When a bee lands on a flower to feed on nectar, the pollen will stick to its body and the bee can carry the pollen to another flower. The pollen helps plants to produce seeds which will grow into new plants. This ensures good biodiversity.

(a) What is meant by the term **biodiversity**? [1 mark]

Graph **A** shows how the number of bees in Ireland has changed over a 40-year period.

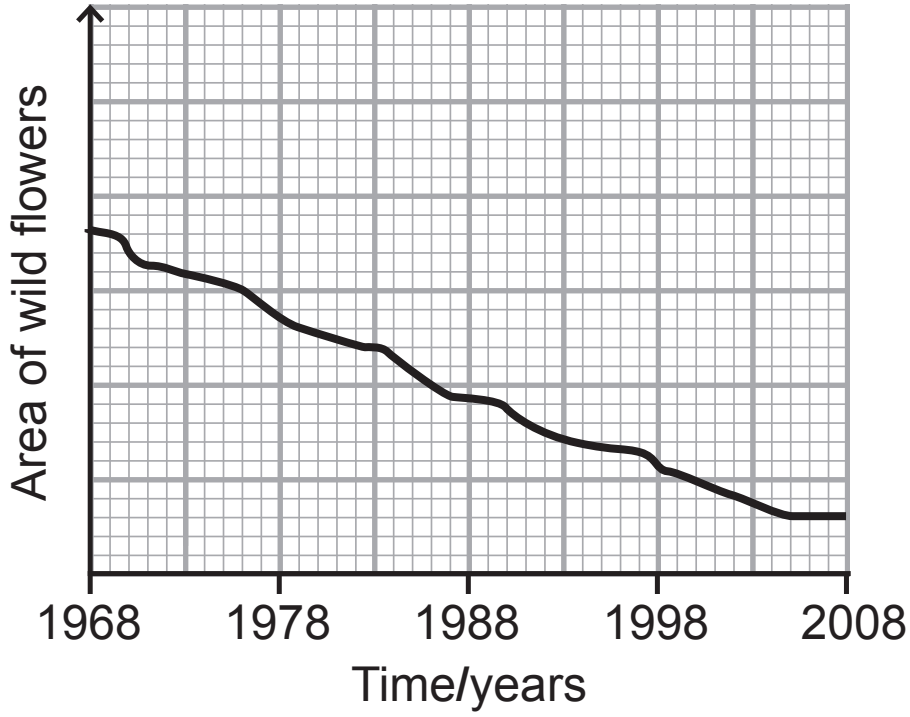
Graph A



(b) Describe the trend shown in this graph. [1 mark]

Graph **B** shows the area of wild flowers in Ireland over the same period.

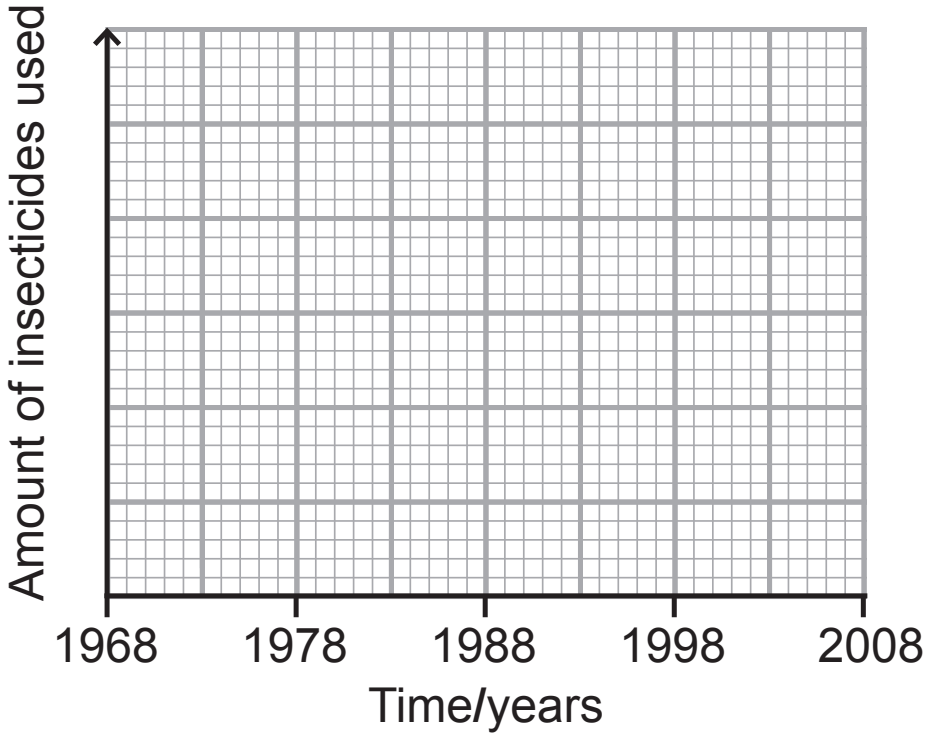
Graph B



(c) Use information from the graphs (**A** and **B**) to explain fully the trend in the number of bees in Ireland.
[2 marks]

(d) Another reason for the trend shown in Graph **A** is the use of insecticides on plants. Insecticides will kill bees.

Use this information to draw a line on the grid below to show how the amount of insecticide used may have changed during the same 40-year period. [1 mark]



(e) Suggest **two** actions that could help increase the number of bees. [2 marks]

1. _____

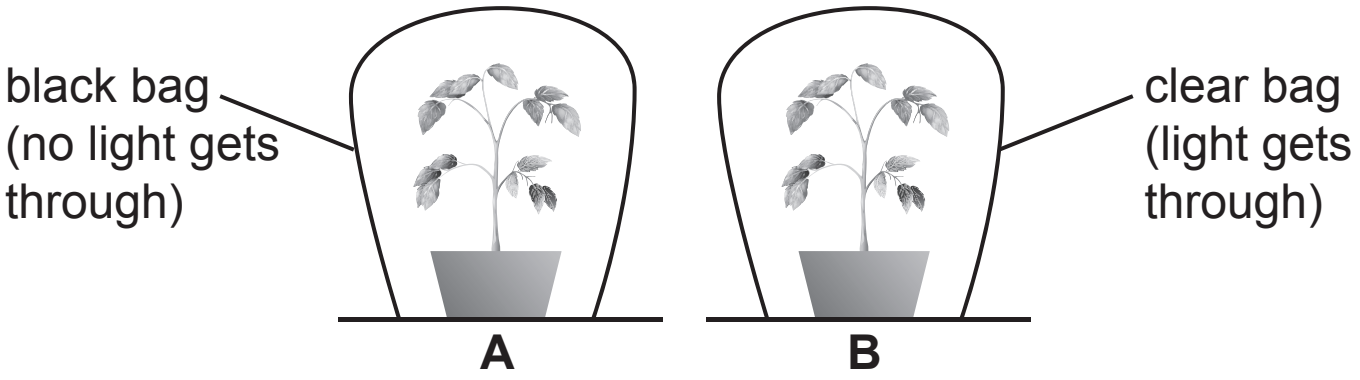
_____

2. _____

_____

8 Photosynthesis is the process by which green plants use sunlight to make food which is stored as starch.

(a) The diagram below shows how an experiment to investigate if light is needed for photosynthesis could be set up.



Before the investigation was set up, both plant **A** and plant **B** were de-starched.

(i) Describe how the plants could have been de-starched. [1 mark]

_____

_____

(ii) What does de-starching do to the plants in this experiment? [1 mark]

_____

_____

(iii) Give **two** factors needed to make the investigation a fair test. [2 marks]

1. _____

2. _____

(b) One leaf was taken from plant **A** and another from plant **B**. Both leaves were tested for the presence of starch using iodine.

Describe and explain the results you would expect for leaf **B**. [2 marks]

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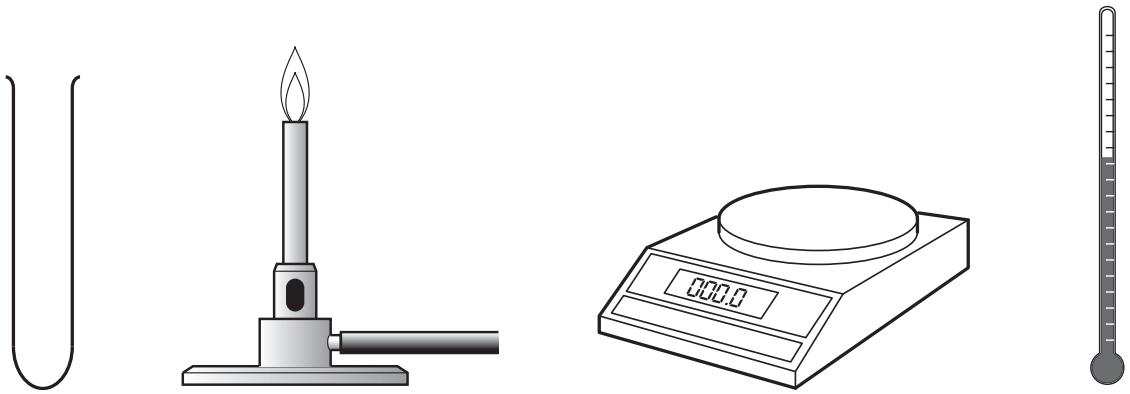
(Questions continue overleaf)

9 Mary wants to find out whether pasta or potato has more energy.

Describe an experiment to compare the amount of energy in these foods. [6 marks]

Some of the equipment Mary could use is shown below.



In this question you will be assessed on your written communication skills including the use of specialist scientific terms.

THIS IS THE END OF THE QUESTION PAPER

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Q6.....Source: CCEA

Q8.....Source: CCEA

Q9.....Source: CCEA

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Question Number	**Marks**
1	
2	
3	
4	
5	
6	
7	
8	
9	
Total Marks	

Examiner Number