

**Monday 20 June 2016 – Morning**

**GCSE ENVIRONMENTAL AND LAND-BASED SCIENCE**

**B682/02** Plant Cultivation and Small Animal Care (Higher Tier)

Candidates answer on the Question Paper.

**OCR supplied materials:**  
None

**Other materials required:**

- Pencil
- Ruler (cm/mm)
- Calculator

**Duration:** 1 hour



Candidate forename		Candidate surname	
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Centre number						Candidate number				
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**INSTRUCTIONS TO CANDIDATES**

- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. HB pencil may be used for graphs and diagrams only.
- Answer **all** the questions.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Write your answer to each question in the space provided. If additional space is required, you should use the lined page(s) at the end of this booklet. The question number(s) must be clearly shown.
- Do **not** write in the bar codes.

**INFORMATION FOR CANDIDATES**

- The quality of written communication is assessed in questions marked with a pencil (✎).
- The number of marks is given in brackets [ ] at the end of each question or part question.
- The total number of marks for this paper is **50**.
- This document consists of **16** pages. Any blank pages are indicated.

**BLANK PAGE**

**PLEASE DO NOT WRITE ON THIS PAGE**

Answer **all** the questions.

- 1 The photograph shows the leaf of a tomato plant infested with whitefly.



A gardener wishes to control the whitefly.

Discuss the **advantages** and **disadvantages** of biological pest control compared to non-biological pest control.

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..... [3]

2 The photograph below shows students preparing plots for planting potatoes.



The students added organic fertiliser to five plots and inorganic fertiliser to five plots.

They planted four seed potatoes in each plot.

After two months, they harvested the potatoes and weighed them.

The results are shown in the table below.

Growing system	Potato yield (kg)					
	Plot 1	Plot 2	Plot 3	Plot 4	Plot 5	Mean
Organic	1.43	4.06	2.98	1.46	4.58	.....
Inorganic	1.46	0.14	0.00	0.44	0.60	0.53

(a) Calculate the mean (average) yield of potatoes in the organic plots.

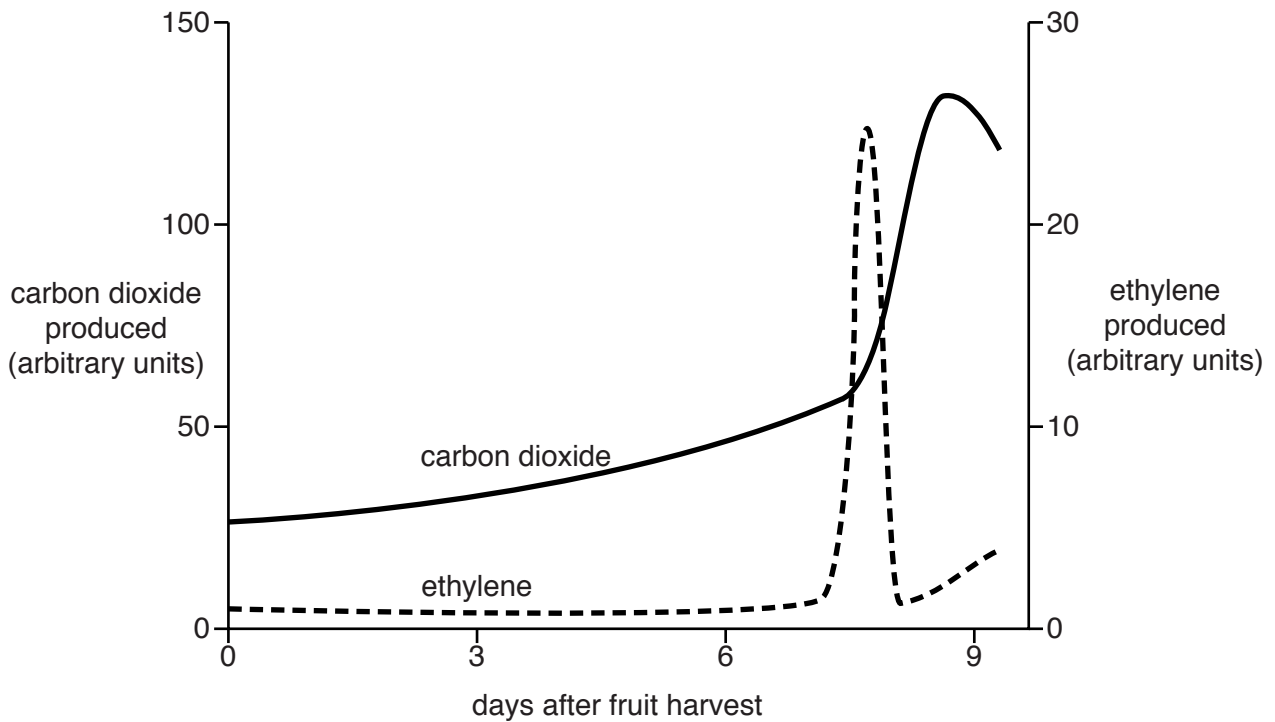
Show your working

..... kg [2]



3 Gases are produced by fruit after harvesting.

The graph below shows the levels of two of the gases produced, carbon dioxide (CO<sub>2</sub>) and ethylene.



Describe the changes in the gases and explain the reasons for these changes.

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..... [4]



6 All modern chickens are originally descended from red jungle fowl.

The photograph below shows two breeds of chicken.

The chicken on the left has been bred for meat production (broiler).

The chicken on the right has been bred for egg production (layer).



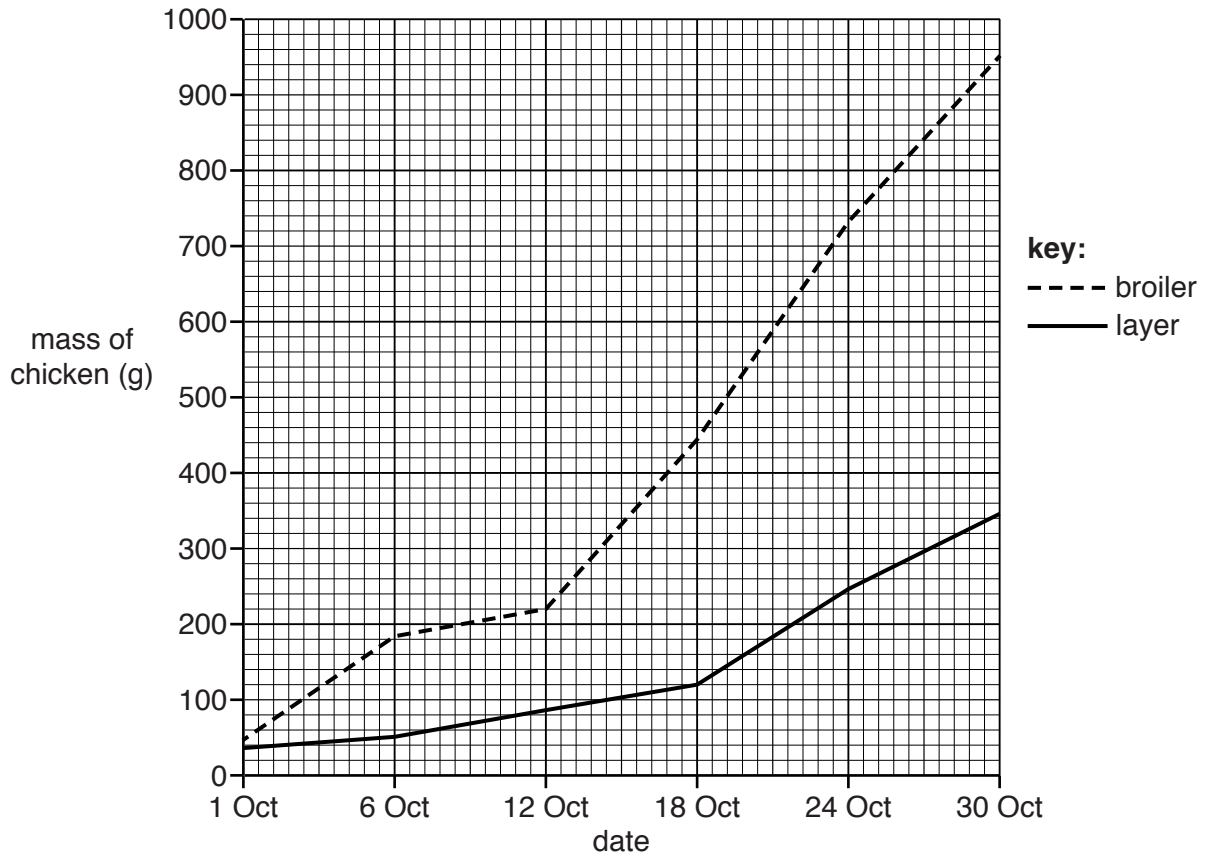
Sarah investigates the growth rate of two breeds of chicken.

She weighs one layer chicken and one broiler chicken on six occasions in the 30 days after hatching.

Sarah's results are shown in the table below and the graph opposite.

Date	Mass of chickens (g)	
	Layer	Broiler
1 October	39	48
6 October	51	181
12 October	82	220
18 October	120	443
24 October	244	730
30 October	342	950





(a) Compare the growth of the layer chicken and the broiler chicken.

Use information from the graph **and** the table in your answer.

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..... [3]

(b) Sarah investigated the growth rate of chickens for 30 days after hatching.

$$\text{growth rate} = \frac{\text{increase in mass (g)}}{\text{number of days taken to increase in mass (days)}}$$

Calculate the growth rate for the broiler chicken.

Show your working.

..... g per day [2]

(c) Suggest **two** ways in which Sarah could improve her investigation.

1 .....

.....

2 .....

.....

[2]

(d) Original red jungle fowl laid between 10 to 15 eggs a year.

Modern varieties have been selectively bred to lay over 300 eggs a year.

Selective breeding can lead to health problems in poultry due to inbreeding.

Explain the dangers associated with inbreeding.

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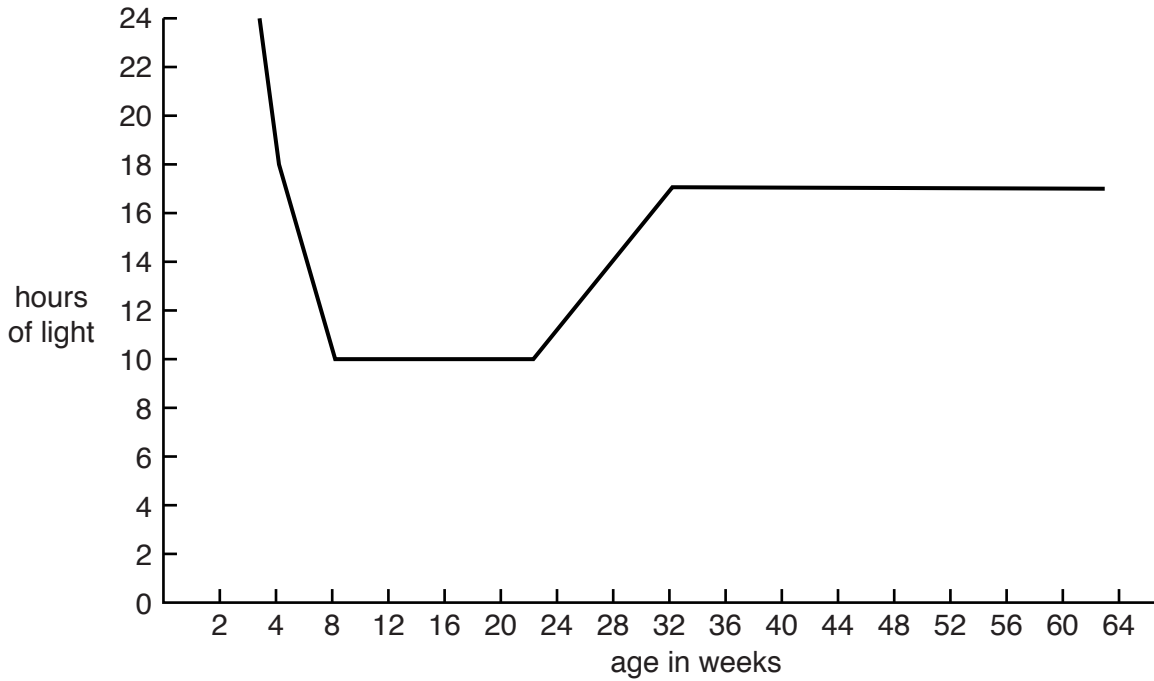
..... [3]



8 Laying hens are often kept in sheds.

The amount of light in the sheds is carefully controlled.

The graph below shows how many hours of light the hens get at different ages.



Hens start laying eggs when the days get longer.

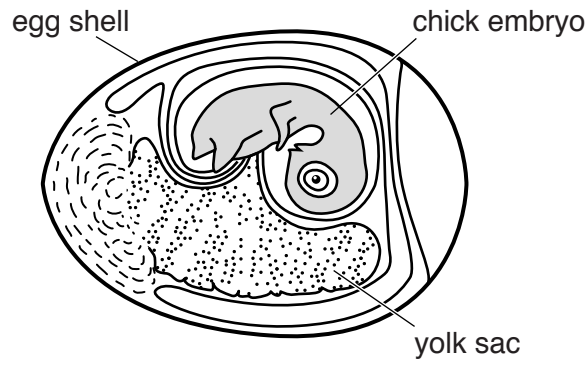
(a) At what age will the hens start laying eggs?

..... [1]

(b) Suggest why birds have evolved in this way.

.....  
.....  
..... [2]

(c) The diagram shows a developing chick embryo.



Eggs shells are porous.

What is the significance of a porous egg shell to the development of the embryo?

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..... [2]

9 Selma has a pet rabbit.

She decides to monitor its activity.

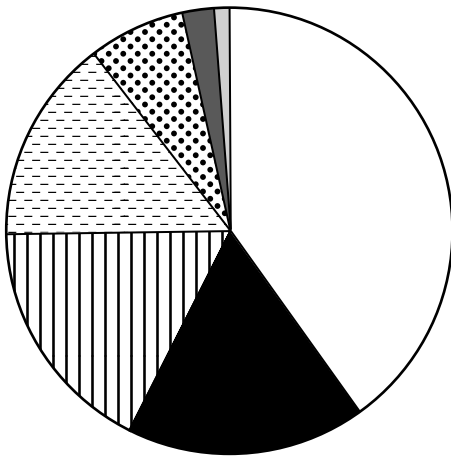
She observes the rabbit for one hour and produces a pie chart to show how long the rabbit spends on different activities.

One week later, she observes the rabbit again for one hour at the same time of day.

She produces a second pie chart to show these results.

**First observation**

Time spent on activity

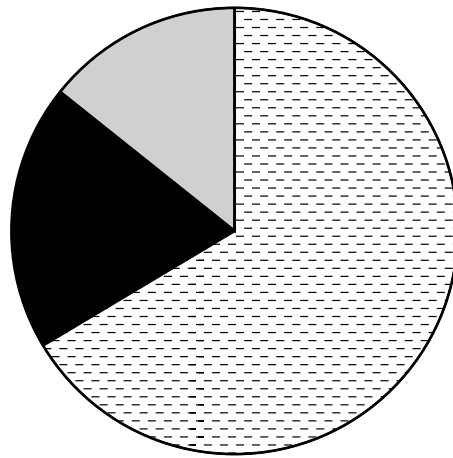


**key:**

- hopping around
- lying down
- feeding on grass
- sleeping
- feeding on solid food
- drinking
- scratching

**Second observation**

Time spent on activity



**key:**

- sleeping
- lying down
- scratching

After her second observation, Selma becomes worried that her rabbit has parasites.

Using the data, describe and explain why.

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..... [2]

10 Paul has a pet dog.

He is thinking about having it castrated.

Discuss the ethical issues for **and** against castrating dogs.

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..... [2]

**END OF QUESTION PAPER**

**ADDITIONAL ANSWER SPACE**

If additional space is required, you should use the following lined page(s). The question number(s) must be clearly shown in the margin(s).

A large rectangular area with a vertical solid line on the left side and horizontal dotted lines across the rest of the page, providing space for writing answers.



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