



Rewarding Learning

General Certificate of Secondary Education
2019–2020

Centre Number

--	--	--	--	--

Candidate Number

--	--	--	--	--

Single Award Science: Biology

Unit 1



Foundation Tier

[GSA11]

GSA11

WEDNESDAY 6 NOVEMBER 2019, MORNING

TIME

1 hour.

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 outside the boxed area on each page or on blank pages.

Complete in black ink only. **Do not write with a gel pen.**

Answer **all ten** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 60.

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 Question **10(b)**.



- 1 (a) Complete the table below about two food groups.

Choose from:

fibre : **growth and repair** : **fat** : **energy store**

Food group	Function
	to prevent constipation
protein	

[2]

- (b) The photographs below show foods that are a good source of either **iron** or **calcium**.



cheese



red meat



green cabbage



milk

- (i) Using ticks (✓) complete the table below to show which mineral each food contains.

Food	Mineral	
	Iron	Calcium
cheese		
red meat		
green cabbage		
milk		

[2]



(ii) Give **one** function of calcium in the body.

Circle the correct answer.

prevents scurvy

strengthens teeth and bones

helps red blood cells carry oxygen

[1]

[Turn over

12635



20GSA1103

2 (a) Shown below are two harmful substances found in cigarette smoke.

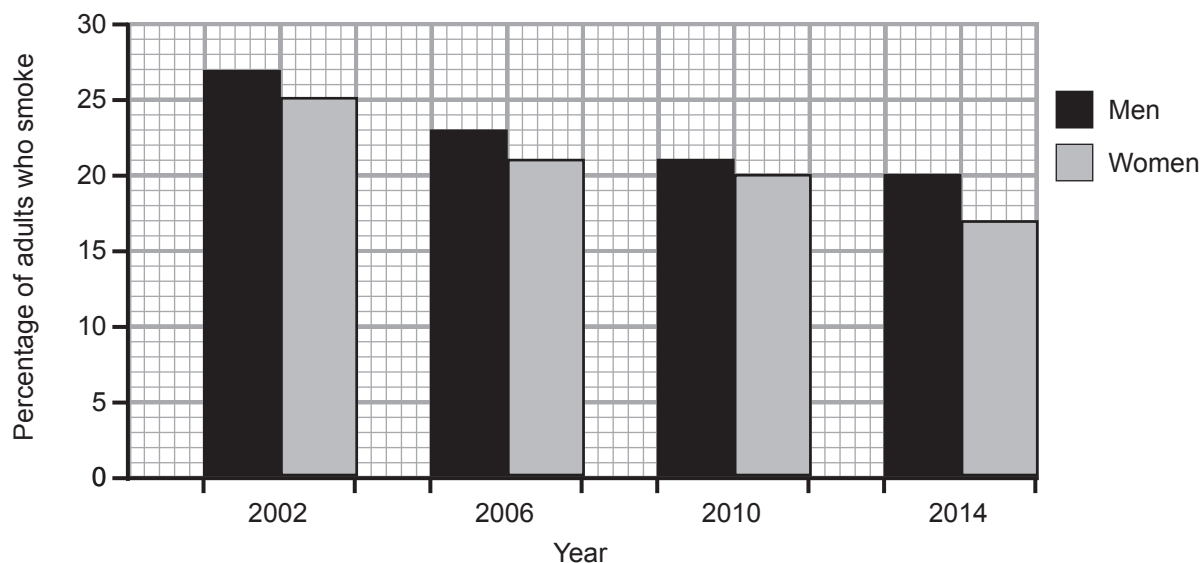
Using lines, link each substance to its harmful effect.

Substance	Harmful effect
nicotine	addictive and increases heart rate
carbon monoxide	reduces the amount of oxygen carried by red blood cells
	causes bronchitis and lung cancer

[2]



(b) The bar graph below shows the percentage of adults who smoked over a twelve year period.



(i) Give **two** conclusions shown by this information.

1. _____

 2. _____

- [2]

(ii) Suggest what change, if any, there will be in the percentage of adults who develop lung cancer due to smoking.

_____ [1]

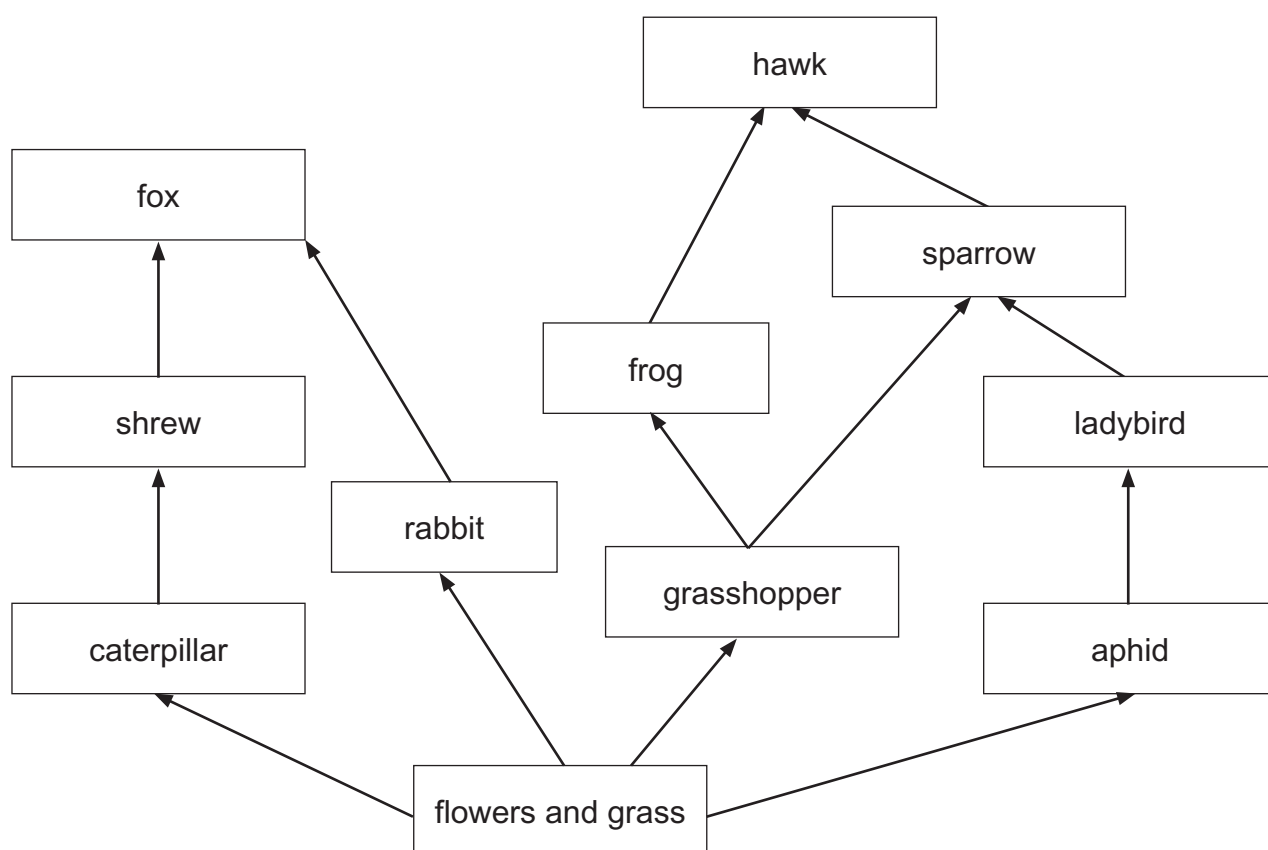
(iii) Suggest **one** reason why treating lung cancer is expensive.

_____ [1]

[Turn over



3 (a) The diagram below shows a food web.



Source: Adapted from 'a grassland food web' Fig 8.6 page 65 of CCEA GCSE Science Single Award, 2nd Ed, Dowds, McFarland, Napier, White

(i) What is the original source of energy for this food web?

_____ [1]

(ii) Name **one** primary consumer in this food web.

_____ [1]

(iii) From this food web, complete the food chain below that contains **three** organisms.



[2]



(b) Use the food web opposite to answer the following questions.

- (i) A gardener used chemicals to kill the aphids in his garden. What effect, if any, will this have on the number of ladybirds? Explain your answer.

[2]

- (ii) Another gardener does **not** want to use chemicals in his garden. Suggest **one** natural way he could reduce the number of aphids.

[1]



- 4 (a) The table below gives four characteristics of some pupils in a class.

Pupil	Can roll tongue	Height/ cm	Hand preference	Hand width/ cm
Niamh	yes	150	right	7
Lucy	yes	141	right	5
Paul	no	149	right	7
David	yes	153	left	8
Emma	no	140	right	5

- (i) Give **one** characteristic from the table that shows discontinuous variation.

_____ [1]

- (ii) Which type of graph would be best for showing discontinuous variation?

Circle the correct answer.

bar graph : line graph : histogram

[1]

- (iii) Calculate the percentage of these pupils that **cannot** roll their tongue.

(Show your working out.)

_____ % [2]



(b) (i) Why is the ability to roll your tongue described as **genetic** variation?

[1]

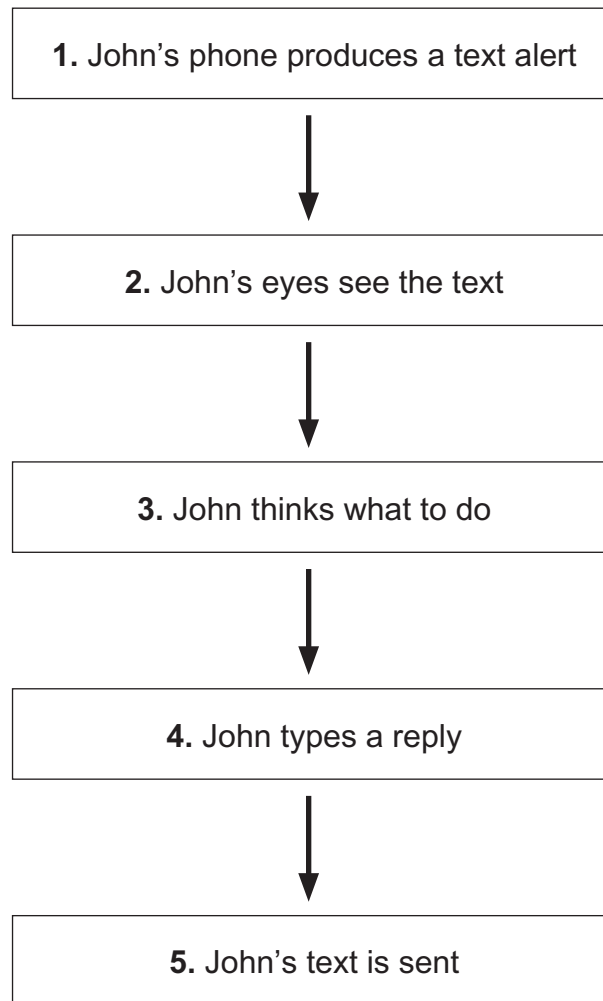
(ii) Apart from the characteristics shown in the table, give **one** example of genetic variation.

[1]

[Turn over



- 5 (a) The flow chart below shows how John's nervous system responds to a text message.



- (i) What evidence in the flow chart suggests that this is a voluntary response?

_____ [1]

- (ii) Which step in the flow chart (1, 2, 3, 4 or 5) involves an effector?

_____ [1]



(b) John also responds to the environment using his hormonal system.

(i) Give **one** difference between the nervous and hormonal systems.

_____ [1]

(ii) Name **one** hormone produced in the body and the organ that produces it.

Hormone: _____

Organ: _____ [2]

[Turn over



6 Many human activities have led to pollution and changes in the environment.

(a) Give **one** abiotic factor that can be used to monitor changes in the environment.

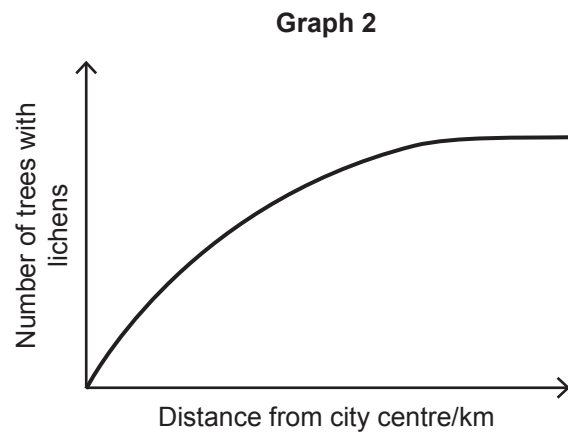
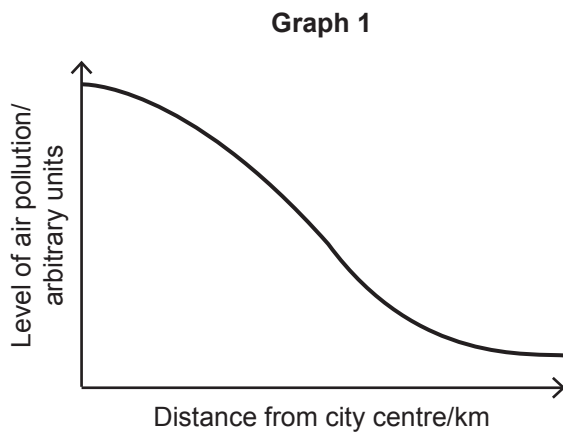
[1]

(b) The photograph below shows lichens growing on a tree.



Source: Principal Examiner

The graphs below show the level of air pollution (**Graph 1**) and the number of trees with lichens (**Graph 2**) in the same area.



(i) Describe fully the trend shown in **Graph 1**.

[2]

(ii) Using **Graphs 1** and **2**, explain why lichens are considered to be pollution monitors.

[1]

(iii) Cars are a source of air pollution. Suggest what effect, if any, banning cars from the city centre will have on the number of trees with lichen in the city centre.

[1]

(c) In 2015 nearly two hundred governments from different countries agreed to try to limit the amount of air pollution.
Explain why efforts to reduce air pollution need to be international.

[1]

[Turn over]



7 The diagram below shows a section of DNA.



Source: Sciencephoto.com F022/8116

(a) What name is given to the shape of DNA?

_____ [1]

(b) DNA is formed into genetic structures called chromosomes. Name the part of a cell where chromosomes are found.

_____ [1]

(c) Some scientists study the genome of organisms. What is meant by the term **genome**?

_____ [1]

(d) Skin cancer can be due to mutations.

(i) Explain fully what is meant by the term **mutation**.

_____ [2]

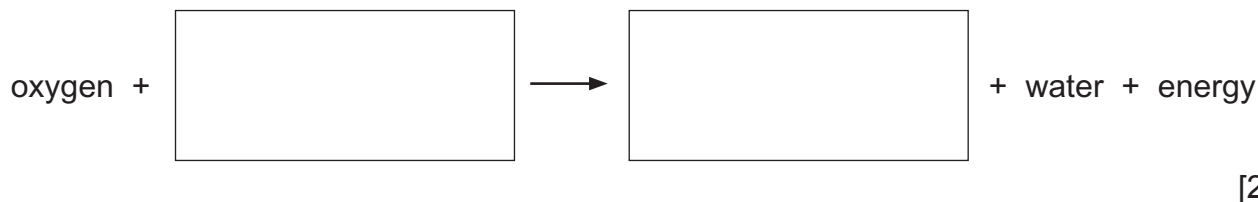
(ii) What environmental factor can cause skin cancer?

_____ [1]



8 (a) Respiration and photosynthesis are processes which can occur in living organisms.

(i) Complete the word equation below for **respiration**.



(ii) Complete the sentence below.

Respiration releases energy, this means it can be described as

an _____ reaction. [1]

(iii) Complete **all** the boxes in the table below to show which process(es) can happen in plants and animals.

Use a ✓ if the process happens or an ✗ if the process does **not** happen.

Process	Plants	Animals
photosynthesis		
respiration		

[2]

(b) (i) Name the structure in a cell where photosynthesis takes place.

_____ [1]

(ii) Suggest **one** reason why being able to photosynthesise is beneficial to the organism.

_____ [1]

[Turn over



- 9 The photograph below shows a typical agricultural field. Almost all the hedgerows have been removed to create a larger field.



Source: Fig 8.11 page 68 of CCEA GCSE Science Single Award, 2nd Ed. Dowds, McFarland, Napier, White

Biodiversity is the term used to describe the range of species in a particular area.

- (a) Give **two** reasons why the removal of hedgerows has reduced biodiversity in this field.

1. _____

2. _____ [2]

- (b) Apart from replanting hedgerows, describe **one** thing the farmer can do to increase biodiversity in this field.

_____ [1]



- (c) Many more houses need to be built in the UK without further reducing biodiversity. State **one** way this can be done without using agricultural land.

[1]

[Turn over

12635



20GSA1117

10 In 1928 Alexander Fleming accidentally discovered a fungus which produced an impure form of penicillin. It then took almost 20 years for penicillin to become a useful and widely available antibiotic.

(a) (i) Name **one** of the scientists who was involved in the development of penicillin as a useful antibiotic.

_____ [1]

(ii) Suggest **one** reason why it took so many years for penicillin to be developed into a useful antibiotic.

_____ [1]



- *20GSA1119*

Sources

Q1b . . . © David Munns / Science Photo Library

Q1b . . . © David Nunuk / Science Photo Library

Q1b . . . © Science Photo Library

Q1b . . . © Science Photo Library

Q2b . . . © ASH Fact Sheet Febuary 2016. / Data source: Office for National Statistics. Licensed under Open Government Licence v3.0

Q3a . . . © CCEA

Q7 . . . © Sergii Iaremenko / Science Photo Library

Q9 . . . © Peter Gudella / Shutterstock

DO NOT WRITE ON THIS PAGE

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
Total Marks	

Examiner Number

Permission to reproduce all copyright material has been applied for.

In some cases, efforts to contact copyright holders may have been unsuccessful and CCEA will be happy to rectify any omissions of acknowledgement in future if notified.

12635



20GSA1120