CCEA GCSE SCIENCE: SINGLE AWARD (MODULAR)

# SCIENCE



## EXAM QUESTION PACK

MODULE 2 FOUNDATION TIER GSC21 PAPERS

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Centre Number

| 71 | |
|---|---|

Candidate Number

| |
|---|
| |

General Certificate of Secondary Education
2012

# Science: Single Award (Modular)

## Human Activity and Health
## Module 2
## Foundation Tier

**[GSC21]**

GSC21

**MONDAY 12 NOVEMBER 2012, AFTERNOON**

**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 seven** 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 | |
| 7 | |
| Total Marks | |



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| Examiner Only | |
|---|---|
| Marks | Remark |

**1** **(a)** Complete the table below about pollution.

Choose from:

**better storage on farms : filters on chimneys :**

**wind : smaller oil tankers : land**

| Type of pollution | Example | Method to reduce effect |
|---|---|---|
| air | acid rain | |
| | household refuse | recycling |
| water | slurry run-off (animal waste) | |

[3]

**(b)** Smoking cigarettes can also cause air pollution. Complete the following sentences.

Choose from:

**addiction : water : tar :**

**nitrogen : carbon monoxide : cancer**

Harmful substances in cigarette smoke include _____

and _____. Nicotine is another harmful substance in

cigarette smoke and it causes _____ . [3]

| Examiner Only | |
|---|---|
| Marks | Remark |
| | |

**2** **(a)** Complete the following flow chart.

Choose from:

**beta : genes : water : UV : protein**

Skin cancer is caused by _____ rays from the Sun burning our skin.

↓

This can damage the _____ in our skin cells.

[2]

**(b)** What is cancer?

**Circle** the correct answer.

**controlled cell division**

**uncontrolled growth of cell size**

**uncontrolled cell division**

[1]

**(c)** The following table shows the number of cases of skin cancer being treated in one local hospital over a ten year period.

| Year | Number of cases of skin cancer |
|---|---|
| 2000 | 46 |
| 2002 | 49 |
| 2004 | 54 |
| 2006 | 52 |
| 2008 | 59 |
| 2010 | 63 |

**(i)** Calculate the increase in the number of people treated for skin cancer from the year 2000 to 2010.

_____ [1]

**(ii)** Suggest **one** reason why the number of cases of skin cancer has increased.

_____ [1]

**(d)** The NHS has a number of screening programmes to detect cancer in the very early stages.

Suggest **one** reason why skin cancer is more likely to be detected at an earlier stage than lung cancer.

_____

_____ [1]

Examiner Only

| Marks | Remark |
|---|---|
| | |

| Examiner Only | |
|---|---|
| Marks | Remark |
| | |

**3** An experiment investigated how the number of plants in a pot affected their growth. Different numbers of plants were put in each pot containing the same type of compost and given the same amount of water each day.

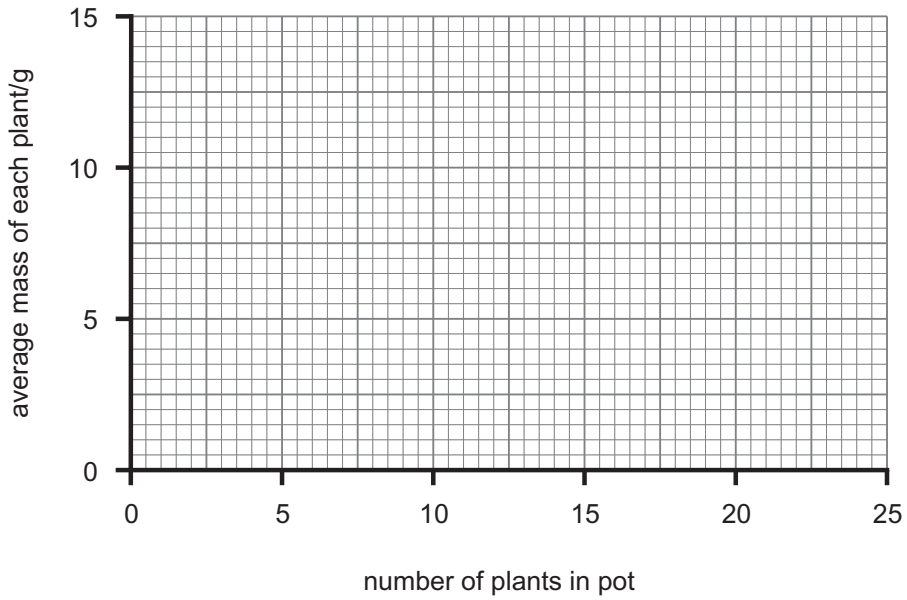
**(a)** State one **other** thing that must be done to make the results valid (fair test).

_____ [1]

**(b)** The results of the investigation are given below.

| Number of plants in pot | Average mass of each plant/g |
|---|---|
| 5 | 13 |
| 10 | 8 |
| 15 | 6 |
| 20 | 5 |
| 25 | 4 |

**(i)** Plot a **line graph** of this information on the grid below.




[2]



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**(ii)** Complete the sentence below to describe the trend shown by the results.

As the number of plants in the pot increased the _____

_____. [1]

**(iii)** Fully explain the results of this experiment.

_____

_____

_____ [2]

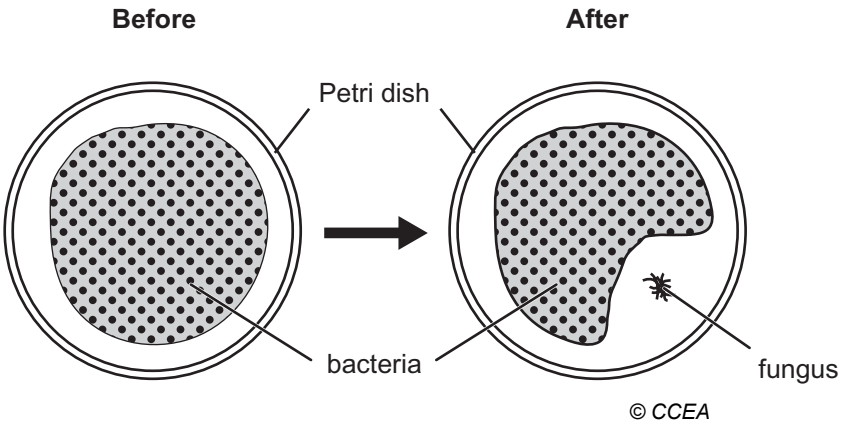
**(iv)** Suggest what would happen if there were 50 plants in a pot.

_____ [1]

| Examiner Only | |
|---|---|
| Marks | Remark |
| | |

| Examiner Only | |
|---|---|
| Marks | Remark |
| | |

**4** **(a)** The following diagram shows what happened when bacteria grown in a Petri dish by Alexander Fleming was contaminated by a fungus.




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**(i)** Describe the effect fungus had on the bacteria.

_____ [1]

**(ii)** Name the antibiotic that was eventually produced following this observation.

_____ [1]

**(b)** Superbugs such as MRSA are difficult to treat because they have become resistant to antibiotics. State **one** way that the spread of MRSA may be reduced in hospitals.

_____ [1]

**(c)** Alcohol is another type of drug used by humans.

| Examiner Only | |
|---|---|
| Marks | Remark |
| | |

**(i)** State **one** way that alcohol:

1. harms an individual. _____

_____

2. harms society. _____

_____ [2]

**(ii)** What is meant by the term **binge drinking**?

_____

_____ [1]

**(iii)** Apart from giving up drinking alcohol, state **two** things that an individual can do to reduce the harm caused by alcohol.

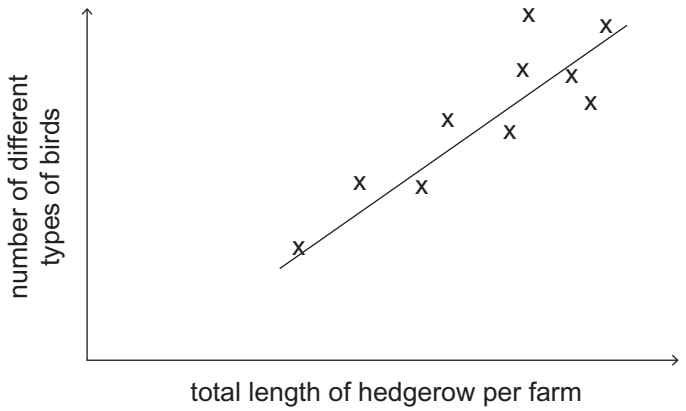
1. _____

2. _____ [2]

| Examiner Only | |
|---|---|
| Marks | Remark |
| | |

**5** **(a)** Many species of farmland birds are endangered and at risk of extinction because of farming activity.

The graph below shows the number of different types of birds found in the hedgerows of ten farms.




**(i)** Describe the trend shown by the graph.

_____

_____ [1]

**(ii)** Suggest **one** reason for the trend shown.

_____

_____ [1]

**(b)** Apart from farming activities, give **two** other ways in which humans can cause extinction of species.

1. _____

2. _____ [2]



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**(Questions continue overleaf)**


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| Examiner Only | |
|---|---|
| Marks | Remark |
| | |

**6** MMR is a combined vaccination that protects against mumps, measles and rubella.

**(a)** Explain fully why antibiotics are not used to treat measles, mumps or rubella.

_____

_____

_____ [2]

In 1998 it was reported that there could be a link between taking the MMR vaccination and developing autism.

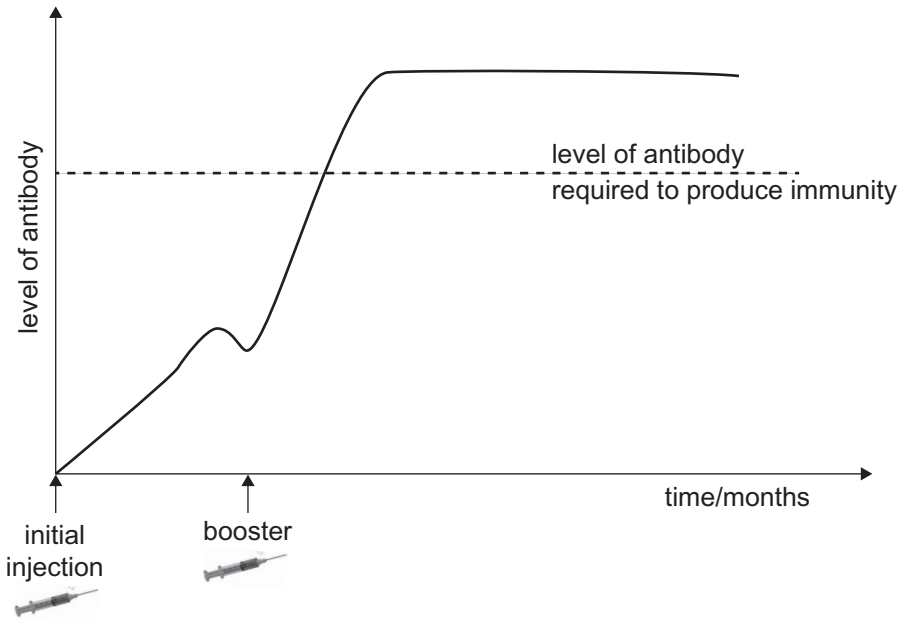
**(b)** Describe and explain how this would have affected the number of children catching measles in the years following 1998.

_____

_____

_____ [2]

**(c)** MMR and many other vaccinations are given in two stages – an initial vaccination followed by a booster some time later. The following diagram shows the antibody level following an initial vaccination and a booster.






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**(i)** Use the graph to explain why a booster is necessary.

_____

_____

_____ [2]

**(ii)** Explain why the immunity produced by vaccinations is described as **active** immunity.

_____

_____ [1]

**(iii)** Use the graph to give **one** feature of active immunity.

_____

_____ [1]

| Examiner Only | |
|---|---|
| Marks | Remark |
| | |

| Examiner Only | |
|---|---|
| Marks | Remark |

**7** **(a)** The following photograph shows a plantation of willow.



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**(i)** Give **one** piece of evidence from the photograph that suggests that the willow has been planted by man rather than growing naturally.

_____ [1]

Willow grows very rapidly and can be harvested as a biofuel after just three year's growth. Overall the use of willow as a biofuel has little effect on atmospheric levels of carbon dioxide and it is therefore described as being a carbon-neutral fuel.

**(ii)** Explain fully why the growing of willow as a biofuel is described as being **carbon-neutral**.

_____

_____

_____

_____ [3]

**(b) (i)** Suggest why the Government encourages farmers to grow willow as a biofuel.

_____ [1]

**(ii)** Suggest **one** way the Government does this.

_____ [1]

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| Marks | Remark |
|---|---|
| | |

**THIS IS THE END OF THE QUESTION PAPER**

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General Certificate of Secondary Education
2012

# Science: Single Award (Modular)

## Human Activity and Health
## Module 2
## Foundation Tier

**[GSC21]**

**MONDAY 12 NOVEMBER 2012**
**2.30 pm–3.15 pm**

# MARK SCHEME



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| | | | | AVAILABLE MARKS |
|---|---|---|---|---|
| **1** | **(a)** | | | |

| Type of pollution | Example | Method to reduce effect |
|---|---|---|
| | | Filters on chimneys |
| Land | | |
| | | Better storage on farms |

[3]

**(b)** tar – carbon monoxide (either order) – addiction [3] — 6

**2** **(a)** UV – genes [2]

**(b)** uncontrolled cell division [1]

**(c)** **(i)** 17 [1]

**(ii)** more continental/foreign holidays/sunbed use [1]

**(d)** easier to see/on skin surface/lungs deep in body [1] — 6

**3** **(a)** placed in same light/temperature/left for same length of time [1]

**(b)** **(i)** all points accurately plotted [2]; one mistake = [1] [2]

**(ii)** the average mass decreased [1]

**(iii)** competition/for water/light/nutrients/space (any two 1 mark each) [2]

**(iv)** the plant's may not have grown/plants died [1] — 7

**4** **(a)** **(i)** fungus stopped growth/killed bacteria [not eating bacteria or made it decrease] [1]

**(ii)** penicillin [1]

**(b)** strict hygiene/isolate patients/restrict use of antibiotics [not stronger antibiotics] [1]

**(c)** **(i)** 1 – harms liver/brain/affects judgement/depressant
2 – violence/relationship problems/affects work/school/cost of treatment
[any appropriate response accepted] [2]

**(ii)** drinking a lot of alcohol on any occasion [1]

**(iii)** **any two from:**
drink alcohol on fewer occasions/drink less on each occasion/ education/seek support [not just drink less] [2] — 8



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| | | | | AVAILABLE MARKS |
|---|---|---|---|---|
| **5** | **(a)** | **(i)** | As the total length of hedgerow increases per farm there are more different types of birds [1] | |
| | | **(ii)** | hedgerows provide food/shelter/nest sites [1] | |
| | **(b)** | | **any two from:** hunting/habitat loss/spreading disease/ introducing non-native species/pollution/overfishing [2] | 4 |
| **6** | **(a)** | | mumps, measles and rubella are caused by a virus; antibiotics only effective against bacterial diseases [not just not effective] [2] | |
| | **(b)** | | fewer children get vaccinated; therefore more catch the measles [2] | |
| | **(c)** | **(i)** | **any two from:** antibody level starting to fall before booster/booster need to raise level above level required to produce immunity/after booster level of antibody remains above the level required for immunity/high [not just increase level of antibodies] [2] | |
| | | **(ii)** | antibodies produced by the body [1] | |
| | | **(iii)** | slow to act/long lasting [1] | 8 |
| **7** | **(a)** | **(i)** | plants all same age/height/evenly spaced [1] | |
| | | **(ii)** | when growing carbon dioxide taken in; during photosynthesis; (approximately equal to) carbon dioxide produced when burnt [3] | |
| | **(b)** | **(i)** | use less fossil fuels/reduce increase in global warming [not just carbon neutral/little effect on atmosphere] [1] | |
| | | **(ii)** | education/grants [1] | 6 |
| | | | **Total** | **45** |



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| Centre Number | |
|---|---|
| 71 | |

| Candidate Number |
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| |

General Certificate of Secondary Education
2011–2012

# Science: Single Award (Modular)

## Human Activity and Health
## Module 2

## Foundation Tier

**[GSC21]**

GSC21

**TUESDAY 15 MAY 2012, MORNING**

**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 seven** 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 | |
| 7 | |
| Total Marks | |



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| Examiner Only | |
|---|---|
| Marks | Remark |

**1** **(a)** Bacteria and fungi are types of disease-causing microbes. Using lines, link each type of microbe to one disease it causes.

| Type of microbe | Disease |
|---|---|
| | Flu |
| Fungi | |
| | Athlete's foot |
| Bacteria | |
| | Gonorrhoea |

[2]

**(b)** Complete the following sentences.

Choose from:

**nitrogen : MRSA : lung cancer : carbon monoxide : polio : emphysema**

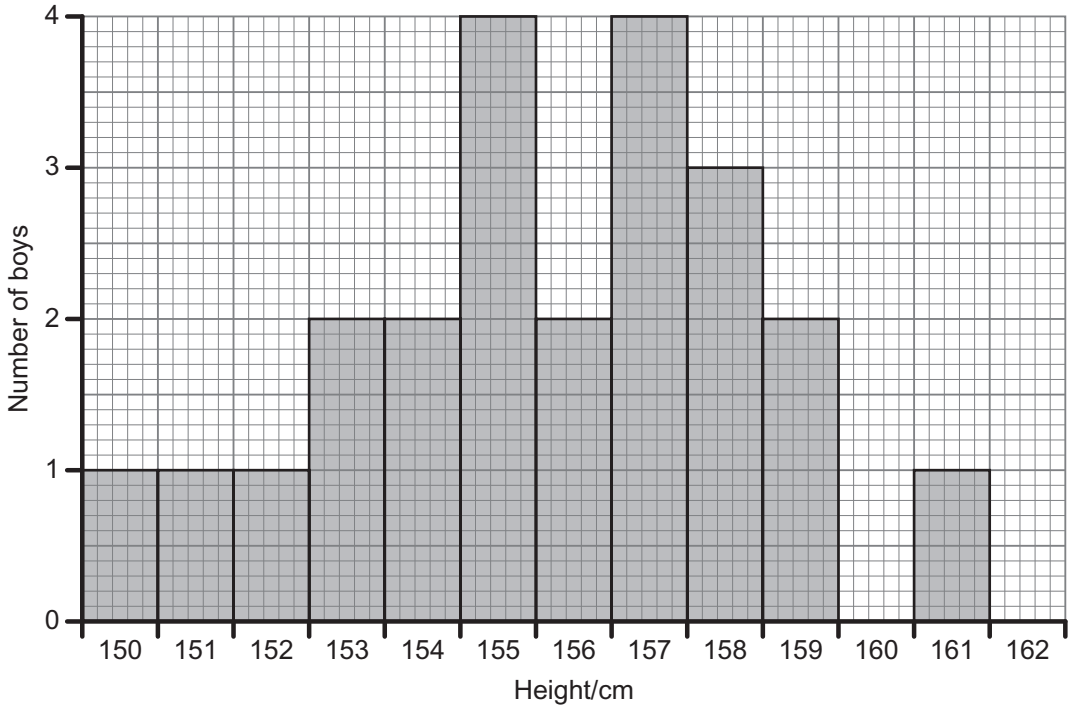
Smoking causes disease and can harm the body. Tar from smoking causes the diseases _____ and _____ . Cigarette smoke also contains the gas _____ which reduces the blood's ability to carry oxygen. [3]



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| Examiner Only | |
|---|---|
| Marks | Remark |
| | |

**2** **(a)** The graph below shows the heights of a class of 13-year-old boys.




**(i)** How many pupils are in the class?

_____ [1]

**(ii)** What are the most common heights in the class?

_____ cm and _____ cm [1]

**(iii)** Height is an example of continuous variation in humans. How can you tell this from the graph?

_____ [1]

**(iv)** Suggest **one** way in which the results will change if the pupils' heights are measured one year later when they are 14 years old.

_____ [1]

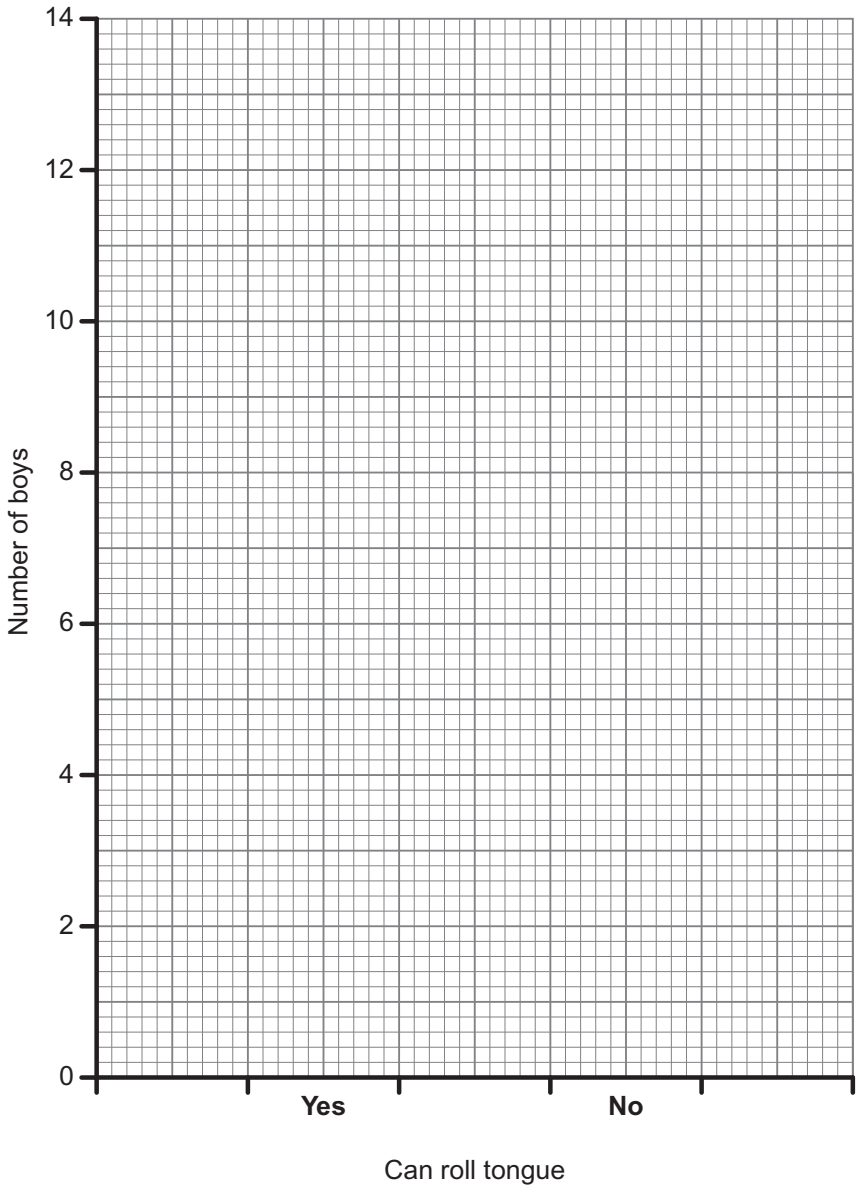


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**(b)** The table below gives information about the number of boys in a youth group who could roll their tongues.

| Can roll tongue | Yes | No |
|---|---|---|
| Number of boys | 12 | 7 |

Draw a **bar chart** of this information on the grid below.



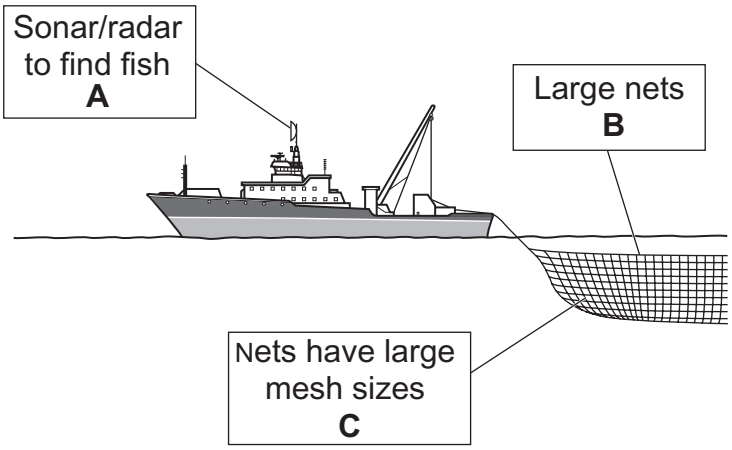

[2]

Examiner Only

| Marks | Remark |
|---|---|
| | |

| Examiner Only | |
|---|---|
| Marks | Remark |
| | |

**3** **(a)** The diagram below shows some features of a modern fishing boat.




**(i)** Which feature shown in the diagram (**A**, **B** or **C**) will help conserve fish stocks?

_____ [1]

**(ii)** State **two** other things that can be done to help conserve fish stocks.

Circle the correct answers.

**sanctuaries where fishing is not allowed**

**increasing the number of fishing days**

**extending the area where boats can fish**

**limiting the number of fishing days by each boat** [2]

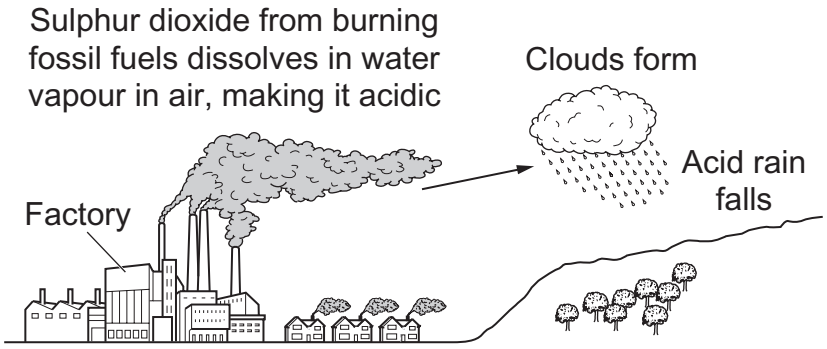
**(iii)** Fish stocks are also at risk due to pollution. Give **one** type of water pollution that harms fish.

_____ [1]



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**(b)** Acid rain is a type of air pollution. The following diagram shows how acid rain occurs.




**(i)** Use the diagram and your knowledge to explain how a country that has few factories can be affected by acid rain if it is close to a country that has many factories.

_____

_____

_____ [2]

The amount of pollution caused by acid rain has been much reduced in recent years.

**(ii)** Suggest **one** way in which the amount of acid rain has been reduced.

_____ [1]

Examiner Only

| Marks | Remark |
|---|---|
| | |



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| Examiner Only | |
|---|---|
| Marks | Remark |
| | |

**4** The population of Northern Ireland is rising rapidly, mainly because people are living longer. One reason why people are living longer is due to better medical care.

**(a)** Give **one** other reason why people are living longer.

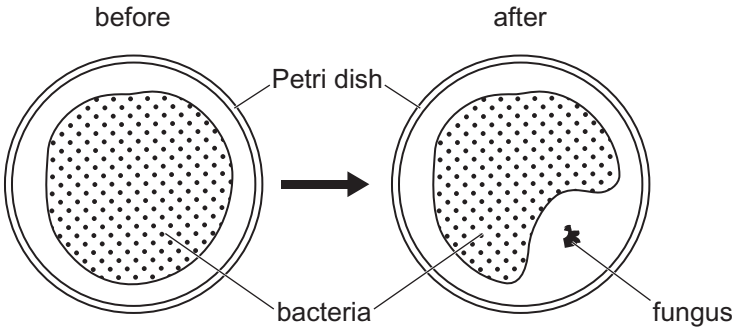
Circle the correct answer.

**more unemployment**

**better diets**

**better road systems** [1]

**(b)** The development of antibiotics is one reason why we have better medical care. The following diagram shows what happened when bacteria grown in a Petri dish by Alexander Fleming was contaminated by a fungus.




**(i)** State two conclusions that can be drawn from this observation.

1. _____

2. _____ [2]

**(ii)** Name the antibiotic that was eventually produced following this observation.

_____ [1]

**(c)** Complete the following sentence.

The spread of 'superbugs' such as _____

can be reduced by having good hygiene in hospitals and avoiding

the over-use of antibiotics which prevents bacteria becoming

_____ to them. [2]



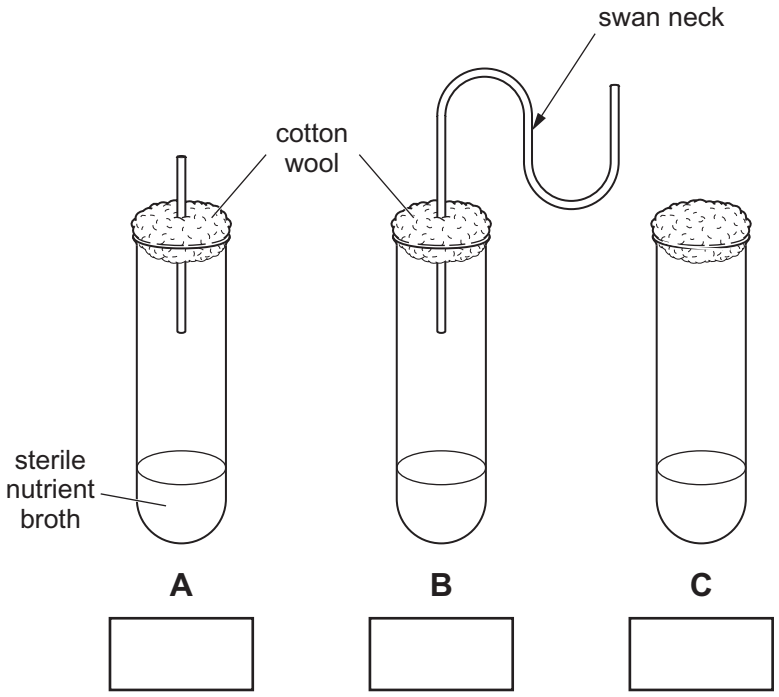
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| Examiner Only | |
|---|---|
| Marks | Remark |

**5** To investigate bacterial growth some sterilised nutrient broth was used in an experiment as shown below.

**(a)** Suggest how the nutrient broth is made sterile.

_____ [1]




**(b)** On the diagram write the word **Yes** or **No** in boxes **A**, **B** and **C** to show if you would expect bacterial growth after two days. [2]

**(c)** State two things that need to be done to make the results valid (fair test).

1. _____

2. _____ [2]

**(d)** Name the scientist who did a similar experiment using a 'swan neck' flask.

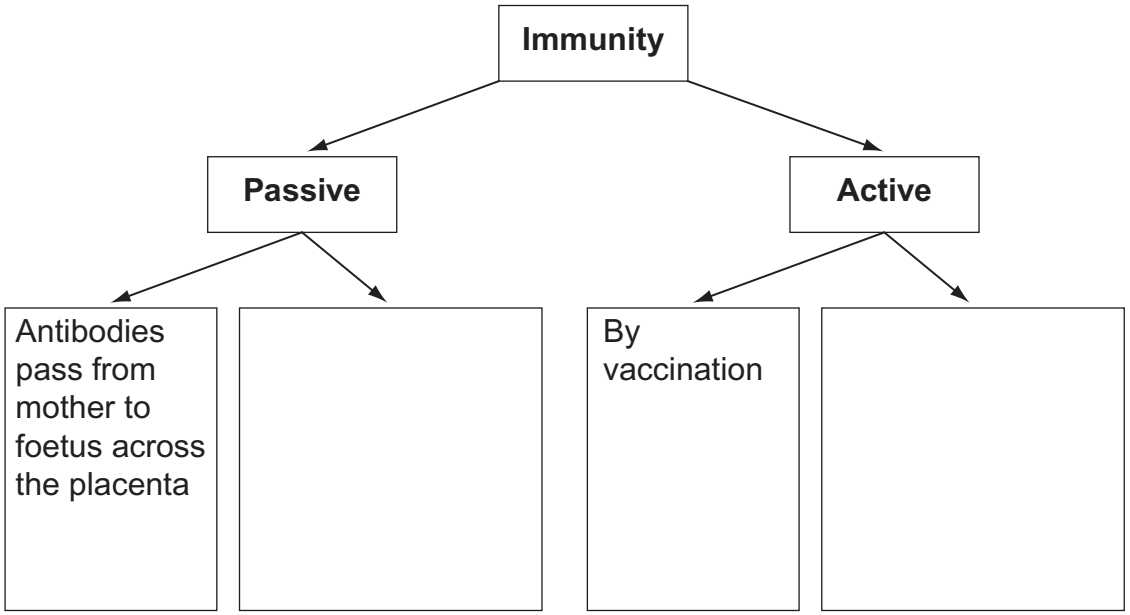
_____ [1]



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| Examiner Only | |
|---|---|
| Marks | Remark |
| | |

**6** **(a)** The following flow chart shows one way that passive immunity is achieved and one way that active immunity is achieved.




**(i)** Complete the diagram by giving one other way that each type of immunity can be achieved. [2]

**(ii)** Give one advantage and one disadvantage of passive immunity.

Advantage _____

_____

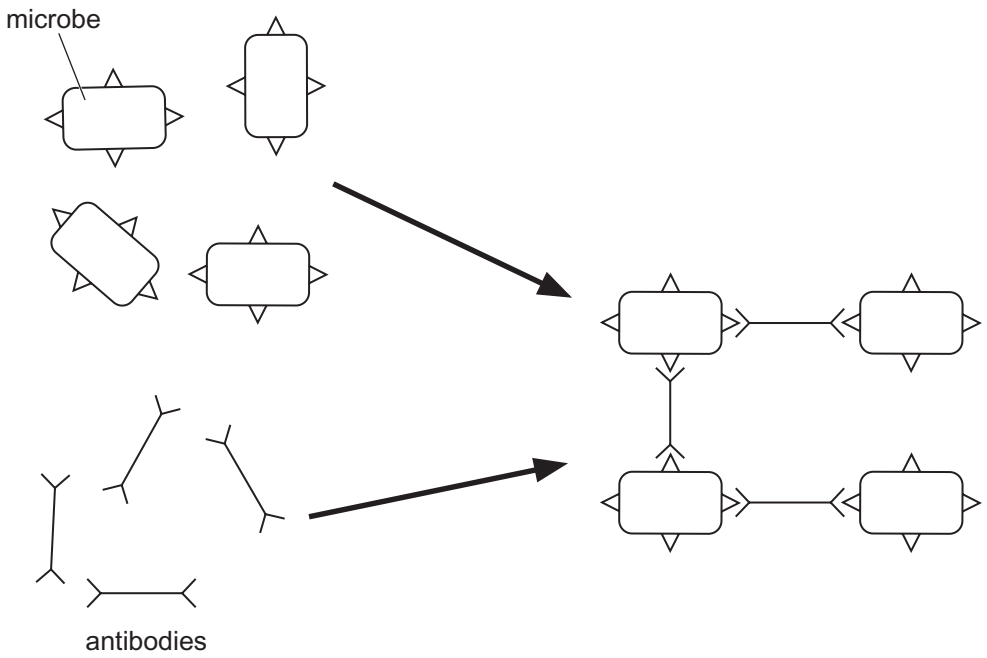
Disadvantage _____

_____ [2]



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**(b)** The diagram below shows how antibodies combat microbes.




**(i)** Use the diagram and your knowledge to explain how antibodies combat microbes.

_____

_____

_____

_____

_____

_____ [3]

**(ii)** Name the process in which white blood cells engulf and digest microbes.

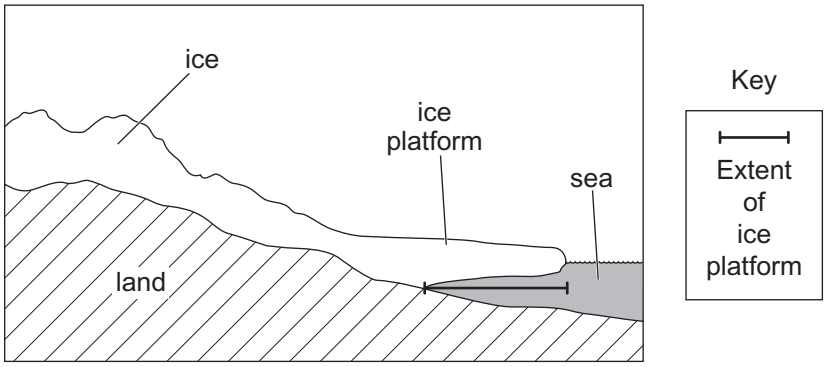
_____ [1]

Examiner Only

| Marks | Remark |
|---|---|
| | |

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|---|---|
| Marks | Remark |

**7** **(a)** Polar bears hunt seals from ice 'platforms'.




The table below shows the maximum distance that the ice platform extended beyond an island in the Arctic from 1950–2010.

| Year | Extent of ice platform/km |
|---|---|
| 1950 | 3.5 |
| 1960 | 3.25 |
| 1970 | 2.8 |
| 1980 | 2.6 |
| 1990 | 2.4 |
| 2000 | 2.3 |
| 2010 | 2.2 |

**(i)** State the trend shown by the information given in the table.

_____

_____ [1]

**(ii)** It is thought that the change in the ice platform is due to global warming. Explain fully the cause of global warming and how this information shows evidence that it is happening.

_____

_____

_____

_____

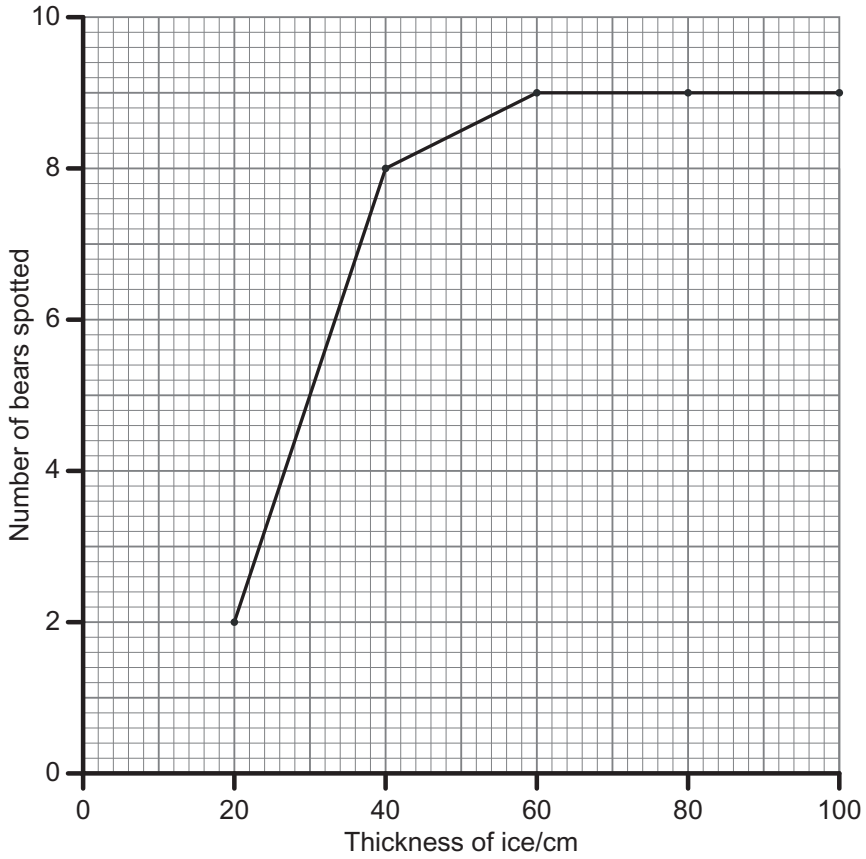
_____ [3]



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|---|---|
| Marks | Remark |
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**(b)** Scientists also found that the platforms are getting thinner and this has affected the number of polar bears on the ice. The graph below shows the number of polar bears spotted on different thicknesses of ice.




**(i)** Suggest a reason why no polar bears have been spotted on ice below 20 cm in thickness.

_____ [1]

**(ii)** Suggest what will happen to polar bears if the ice thickness continues to decrease.

_____ [1]

The extent and thickness of ice are examples of abiotic factors.

**(iii)** What is meant by the term **abiotic**?

_____ [1]

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General Certificate of Secondary Education
2011–2012

# Science: Single Award (Modular)

## Human Activity and Health
## Module 2

Foundation Tier

**[GSC21]**

**TUESDAY 15 MAY 2012**
**9.15 am–10.00 am**

# MARK SCHEME



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| | | | | | AVAILABLE MARKS |
|---|---|---|---|---|---|
| **1** | **(a)** | Fungi – Athlete's foot;<br>Bacteria – Gonorrhoea | | [2] | |
| | **(b)** | lung cancer – emphysema – carbon monoxide | | [3] | 5 |
| **2** | **(a)** | **(i)** | 23 | [1] | |
| | | **(ii)** | 155 and 157 | [1] | |
| | | **(iii)** | small gradations/no discrete groups/many bars | [1] | |
| | | **(iv)** | [all] taller/most common height(s) taller/bars move to right | [1] | |
| | **(b)** | both bars correct = 2, one bar correct = 1 | | [2] | 6 |
| **3** | **(a)** | **(i)** | large mesh sizes/C | [1] | |
| | | **(ii)** | sanctuaries where fishing not allowed; limiting the number of fishing days | [2] | |
| | | **(iii)** | nitrate pollution/oil spillages/sewage/slurry/silage | [1] | |
| | **(b)** | **(i)** | $SO_2$ dissolves/(acid rain) forms/in clouds; clouds move | [2] | |
| | | **(ii)** | filters/alternative fuels/(burning) less fossil fuels | [1] | 7 |
| **4** | **(a)** | better diets | | [1] | |
| | **(b)** | **(i)** | fungus killed/stopped growth of bacteria; substance diffusing | [2] | |
| | | **(ii)** | penicillin | [1] | |
| | **(c)** | MRSA (allow *C. difficile*) – resistant | | [2] | 6 |
| **5** | **(a)** | boiling the broth/strongly heating | | [1] | |
| | **(b)** | Yes No No (all 3 correct = 2; 2 correct = 1) | | [2] | |
| | **(c)** | same temperature; same type of broth | | [2] | |
| | **(d)** | Pasteur | | [1] | 6 |

| | | | | | AVAILABLE MARKS |
|---|---|---|---|---|---|
| 6 | (a) | (i) | Passive – injection of antibodies/mother's milk;<br>Active – catching the disease/named disease/illness | [2] | |
| | | (ii) | passive immunity is faster acting;<br>passive immunity lasts for a shorter period of time/not permanent | [2] | |
| | (b) | (i) | antibodies same shape/complementary to antigens; combine with antigen/microbe; clump bacteria together/stop them spreading in body | [3] | |
| | | (ii) | phagocytosis | [1] | 8 |
| 7 | (a) | (i) | extent of ice platform decreases with time | [1] | |
| | | (ii) | ice platform decreases/less ice/ice melting; increased carbon dioxide levels in atmosphere/traps heat; increased combustion/deforestation/ reduced photosynthesis | [3] | |
| | (b) | (i) | ice too thin [to support weight]/ice breaks/polar bears too heavy | [1] | |
| | | (ii) | endangered/extinct | [1] | |
| | | (iii) | non-living factor | [1] | 7 |
| | | | | **Total** | **45** |



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Centre Number

| 71 | |
|---|---|

Candidate Number

| |
|---|
| |

General Certificate of Secondary Education
2011–2012

# Science: Single Award (Modular)

## Human Activity and Health
## Module 2
## Foundation Tier

**[GSC21]**

GSC21

**MONDAY 27 FEBRUARY 2012**
**11.00 am–11.45 am**

**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 seven** 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 | |
| 7 | |
| Total Marks | |



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| Examiner Only | |
|---|---|
| Marks | Remark |
| | |

**1** **(a)** Given below are two examples of pollution. Using lines, link the example of pollution to a suitable method of reducing its effect.

| **Example of pollution** | **Method to reduce effect** |
|---|---|
| acid rain | bigger bins |
| household waste | recycling |
| | filters on chimneys |

[2]

**(b)** Complete the following sentence.

Choose from:

**oxygen : nitrate : untreated sewage : carbon dioxide**

A chemical called _____ is found

in _____ and can cause water pollution

when it gets into rivers. [2]



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| Examiner Only | |
|---|---|
| Marks | Remark |
| | |

**2** **(a)** The following table provides information about some pupils in a class.

| | Characteristic | | |
|---|---|---|---|
| **Pupil** | **Height/cm** | **Eye colour** | **Can roll tongue** |
| Jane | 155 | Blue | Yes |
| Tom | 157 | Blue | No |
| Orla | 141 | Brown | No |
| Jack | 150 | Blue | Yes |
| Brendan | 149 | Brown | Yes |

**(i)** How many pupils had blue eyes **and** could roll their tongues?

_____ [1]

**(ii)** Which characteristic shows continuous variation?

_____ [1]

**(b)** Human body cells normally have 46 chromosomes.

**(i)** How many chromosomes are in each cell of someone with Down's syndrome?

**Circle** the correct answer.

**23** **46** **47** [1]

**(ii)** What are changes to chromosome number or structure called?

Choose from:

**UV light** : **mutations** : **infections**

_____ [1]



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| Examiner Only | |
|---|---|
| Marks | Remark |

**3** **(a)** The tar in tobacco smoke is very harmful to the body.

**(i)** State two effects that **tar** in tobacco smoke has on the body.

Choose from:

**causes emphysema : is addictive**

**causes cancer : affects heart rate**

1. _____

2. _____ [2]

**(ii)** Suggest what passive smoking is.

_____ [1]

**(b)** Alcohol can also be harmful to the body. Mrs. Smith is giving her Year 11 class a talk about 'responsible' alcohol consumption.

**(i)** State two things she could recommend as part of 'responsible' alcohol consumption.

1. _____

2. _____ [2]

**(ii)** Many bars and clubs remain open much later than they used to and in the city centre do not all close at the same time.

Suggest **one** way this could help reduce alcohol-related violence.

_____

_____ [1]



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| Examiner Only | |
|---|---|
| Marks | Remark |

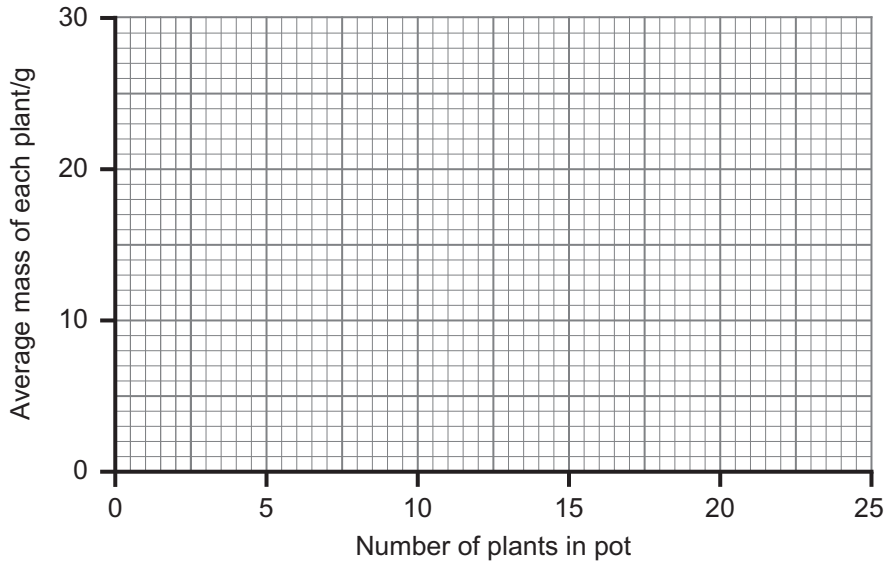
**4** Niamh carried out an investigation to check if the number of plants in a pot affected the growth of the plants.

The table below shows some of her results.

| Number of plants in the pot | Average mass of each plant/g | Total mass of all the plants in each pot/g |
|---|---|---|
| 5 | 28 | 140 |
| 10 | 22 | 220 |
| 15 | 17 | 255 |
| 20 | 9 | 180 |
| 25 | 4 | |

**(a) (i)** Complete the table above. [1]

**(ii)** On the grid below, plot a line graph for the **average mass** of each plant against the number of plants in the pot.




[2]

**(iii)** Complete the following sentence to give a trend shown by the results.

As the number of plants in the pot increases

the _____ decreases. [1]



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**(iv)** Explain fully the trend described in part **(iii)**.

_____

_____

_____ [2]

**(b)** Productivity is a term that describes plant growth. In this experiment it is the total mass of plant material in each pot.

In which planting density (pot) is there the greatest productivity?

**Circle** the correct answer.

**5** **10** **15** **20** **25**

[1]

**(c)** **(i)** State two things that Niamh would have done during her investigation to make sure her results were valid (a fair test).

1. _____

2. _____ [2]

**(ii)** Niamh decided to repeat the experiment. Suggest why it is good science to do this.

_____ [1]

Examiner Only

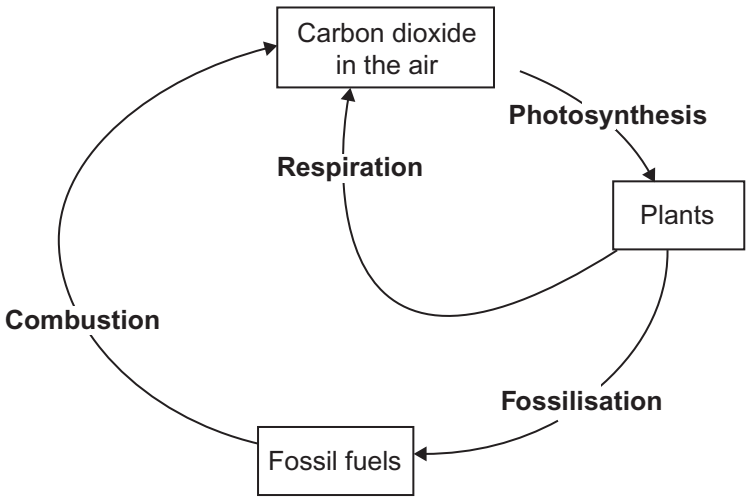
| Marks | Remark |
|---|---|
| | |



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| Examiner Only | |
|---|---|
| Marks | Remark |
| | |

**5** **(a)** The following diagram shows part of the carbon cycle.




**(i)** Use the information provided and your knowledge to give **two** reasons why the level of carbon dioxide in the air has **increased** in recent years.

_____

_____

_____ [2]

**(ii)** Name the environmental problem caused by increasing carbon dioxide levels.

_____ [1]



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**(b)** The following diagram shows some pine trees growing in a forest.



Pine trees keep their leaves all year round and can be grown on poorer quality soils than many of our native trees.

**(i)** Use the information provided and your knowledge to describe and explain **one** environmental advantage of planting pine forests.

_____

_____

_____ [2]

**(ii)** Unlike pine trees, oak and ash trees only have leaves in the Summer months. Suggest why pine forests have very few Spring plants such as bluebell compared to forests of oak or ash.

_____

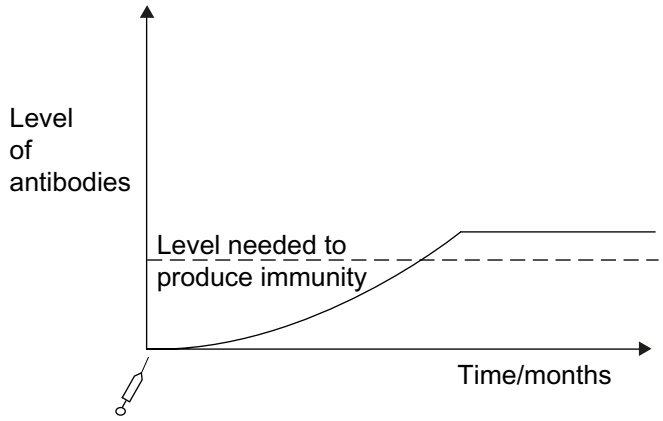
_____ [1]

Examiner Only

| Marks | Remark |
|---|---|
| | |

| Examiner Only | |
|---|---|
| Marks | Remark |

**6** **(a)** The following graph shows how the levels of antibody change in the blood following a vaccination.




Use **only** the information provided to answer parts **(i)** and **(ii)**.

**(i)** Give **one** reason why vaccinations for common illnesses are given to babies and young children many months before they are likely to come in contact with infections.

_____ [1]

**(ii)** What is the evidence that vaccinations provide long-term protection?

_____ [1]

**(b)** Colin got the flu vaccination in September. He gets infected with the flu virus in February. Explain how the vaccination stops him getting ill.

_____

_____

_____

_____

_____

_____ [4]



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|---|---|
| Marks | Remark |

**(c) (i)** Travellers to certain foreign countries have to get a number of 'travel' vaccinations before they travel.

Explain why these travel vaccinations are necessary.

_____

_____

_____ [2]

**(ii)** Name the type of immunity that travel vaccinations provide.

_____ [1]

| Examiner Only | |
|---|---|
| Marks | Remark |

**7** **(a)** Zebra mussels are an example of a competitive invasive species.



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They have spread across most of the major waterways in Northern Ireland and are damaging natural habitats. Zebra mussels were accidentally introduced into Ireland as a result of human activity. They produce a sticky substance that allows them to attach to hard objects such as rocks and the bottom of boats.

**(i)** Suggest **one** way that man has helped zebra mussels spread to Ireland.

_____ [1]

**(ii)** Name **one** other competitive invasive species.

_____ [1]

**(iii)** State **two** characteristics of competitive invasive species.

_____

_____ [2]

**(b)** We can monitor the health of the environment by using abiotic and biotic information.

**(i)** What is meant by a biotic factor?

_____ [1]

**(ii)** Name **one** organism that can be used to monitor pollution levels.

_____ [1]



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General Certificate of Secondary Education
2011–2012

# Science: Single Award (Modular)

## Human Activity and Health
## Module 2
## Foundation Tier

**[GSC21]**

**MONDAY 27 FEBRUARY**
**11.00 am – 11.45 am**

# MARK SCHEME



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| | | | | | AVAILABLE MARKS |
|---|---|---|---|---|---|
| **1** | **(a)** | | acid rain – filters on factory chimneys<br>household waste – recycling | [2] | |
| | **(b)** | | nitrate – untreated sewage | [2] | 4 |
| **2** | **(a)** | **(i)** | two | [1] | |
| | | **(ii)** | height | [1] | |
| | **(b)** | **(i)** | 47 | [1] | |
| | | **(ii)** | mutations | [1] | 4 |
| **3** | **(a)** | **(i)** | causes emphysema; causes cancer | [2] | |
| | | **(ii)** | breathing other people's smoke | [1] | |
| | **(b)** | **(i)** | wait until legal age/mature;<br>drink on fewer occasions;<br>drink less on each occasion/do not binge drink;<br>drink low alcohol drinks;<br>stick to recommended limits;<br>do not drink drive;<br>do not drink when pregnant/when on medication<br>(any two) | [2] | |
| | | **(ii)** | slower drinking/no need to rush before "closing time"/everyone not on street at same time | [1] | 6 |
| **4** | **(a)** | **(i)** | 100 | [1] | |
| | | **(ii)** | all plots correct = 2; 3–4 correct = 1 [bar chart −1] | [2] | |
| | | **(iii)** | (average) mass | [1] | |
| | | **(iv)** | competition between plants; for water; compost; light; space<br>(any two) | [2] | |
| | **(b)** | | 15 plants per pot | [1] | |
| | **(c)** | **(i)** | same light; temperature; water; same type of plant; left for same time; same compost/volume of compost/type/size of pots<br>(any two) | [2] | |
| | | **(ii)** | reliability/to obtain an average [not valid] | [1] | 10 |

| | | | | | AVAILABLE MARKS |
|---|---|---|---|---|---|
| **5** | **(a)** | **(i)** | more combustion; deforestation/fewer trees | [2] | |
| | | **(ii)** | global warming/greenhouse effect | [1] | |
| | **(b)** | **(i)** | photosynthesis longer; more $CO_2$ taken in **or** increased area of forests; more photosynthesis/more $CO_2$ taken in/saves natural forests | [2] | |
| | | **(ii)** | less light reaching forest floor/unable to photosynthesise | [1] | 6 |
| **6** | **(a)** | **(i)** | length of time to produce (enough) antibodies/reach immunity | [1] | |
| | | **(ii)** | number remains constant/no or very small reduction with time/ lasts months/stays above line | [1] | |
| | **(b)** | | modified (flu-causing) microbes; antibodies produced by body; combine/complementary to antigen/microbe/attach; form clumps of microbes/immobilisation; phagocytosis; memory cells remain (any four) | [4] | |
| | **(c)** | **(i)** | new microbes/antigens/diseases; no antibodies to combat/new antibodies needed | [2] | |
| | | **(ii)** | active | [1] | 9 |
| **7** | **(a)** | **(i)** | spread by boats or other acceptable method | [1] | |
| | | **(ii)** | rhododendron/grey squirrel | [1] | |
| | | **(iii)** | non-native/introduced by man; spread/number rising/grow quickly/ reproduce fast; damage habitats/native species/more successful/ dominant than native species (any two) | [2] | |
| | **(b)** | **(i)** | living/plant and animal | [1] | |
| | | **(ii)** | lichens | [1] | 6 |
| | | | **Total** | | **45** |



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| |
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General Certificate of Secondary Education
2011–2012

# Science: Single Award (Modular)

## Human Activity and Health
## Module 2

### Foundation Tier

**[GSC21]**

**TUESDAY 8 NOVEMBER 2011**
**2.30 pm–3.15 pm**

GSC21

**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 seven** 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 | |
| 7 | |
| Total Marks | |



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| Examiner Only | |
|---|---|
| Marks | Remark |
| | |

**1** **(a)** **(i)** Complete the following sentences.

Choose from:

**nitrogen : bronchitis : addiction : carbon monoxide**

Smoking can harm the body. Harmful substances in cigarette smoke include nicotine and _____. Tar is also present and can cause _____. [2]

**(ii)** What is the effect of nicotine on the body?

_____ [1]

**(b)** Drugs can also cause harm. Using lines, link each type of drug to its main effect.

| Drug | Effect |
|---|---|
| Cocaine | Makes users angry |
| Cannabis | Gives users a 'high' |
| | Makes users feel relaxed |

[2]



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**(c)** John enjoys drinking alcohol but thinks that he may be drinking too much and harming his body.

**Circle** two things that he could do to limit his alcohol intake.

**drink coffee**

**stick to recommended limits**

**drink low alcohol drinks**

**binge drink at weekends** [2]

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|---|---|
| Marks | Remark |
| | |

| Examiner Only | |
|---|---|
| Marks | Remark |
| | |

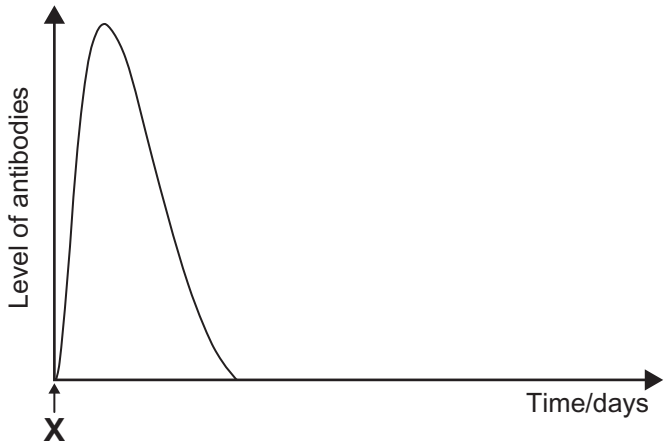
**2** **(a)** Name a disease caused by a virus.

Choose from:

**thrush** **polio** **tuberculosis**

_____ [1]

**(b)** The following graph shows how the number of antibodies in the blood changes during passive immunity.




**(i)** State what is given at **X** to produce passive immunity.

Choose from:

**booster** **antibodies** **blood**

_____ [1]



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| Examiner Only | |
|---|---|
| Marks | Remark |

**(ii)** Give one advantage of passive immunity.

Choose from:

**is permanent : works quickly : only lasts for short time**

_____ [1]

**(c)** Name the type of microbe that antibiotics defend against.

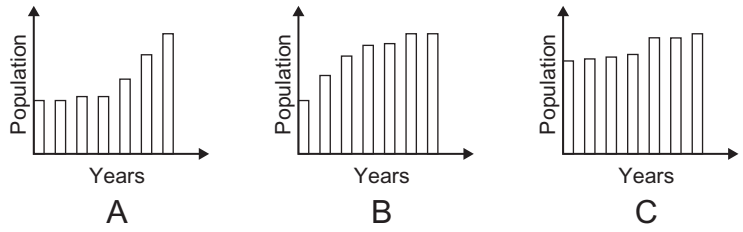
Choose from:

**virus bacteria fungi**

_____ [1]

**(d)** Better health has helped the human population to increase.

Which of the following graphs best shows this increase?




Answer (A, B or C) _____ [1]



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|---|---|
| Marks | Remark |
| | |

**3** **(a)** Use the key below to identify each of the following animals.

**A** **B** **C**

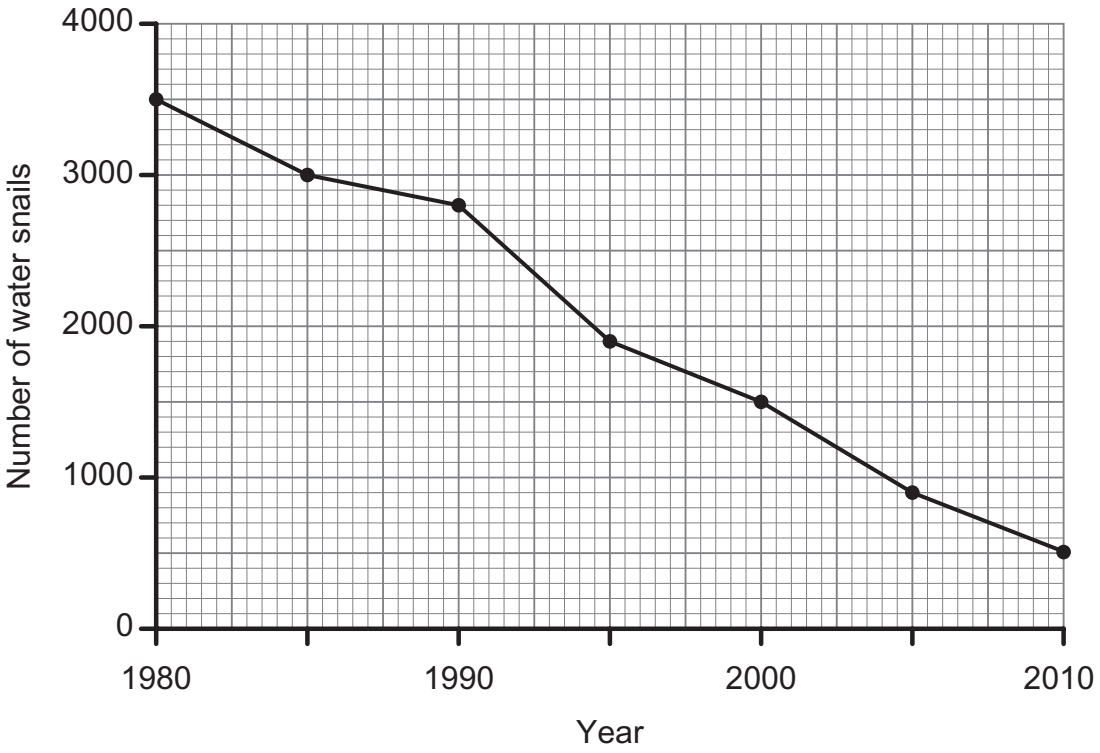


Place a letter (**A**, **B** or **C**) in the correct box beside the animal's name.

| | | | |
|---|---|---|---|
| **1** | Shell present | Water snail | |
| | Shell absent | go to 2 | |
| **2** | Wings present | Insect | |
| | Wings absent | Spider | |

[2]

**(b)** The graph below shows the results of a survey of water snails in a Northern Ireland river over the last thirty years.






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**(i)** Calculate the change in the number of water snails from 1980 to 2010.

**Show your working**

_____ [2]

**(ii)** Snails have become an endangered species. What will happen to them if their numbers continue to fall?

_____ [1]

**(iii)** What is the most likely reason for the falling number of water snails?

Choose from:

**increasing water levels : pollution : more food available**

_____ [1]

**(iv)** Give two pieces of information that show that the survey of water snails is reliable.

1. _____

2. _____ [2]

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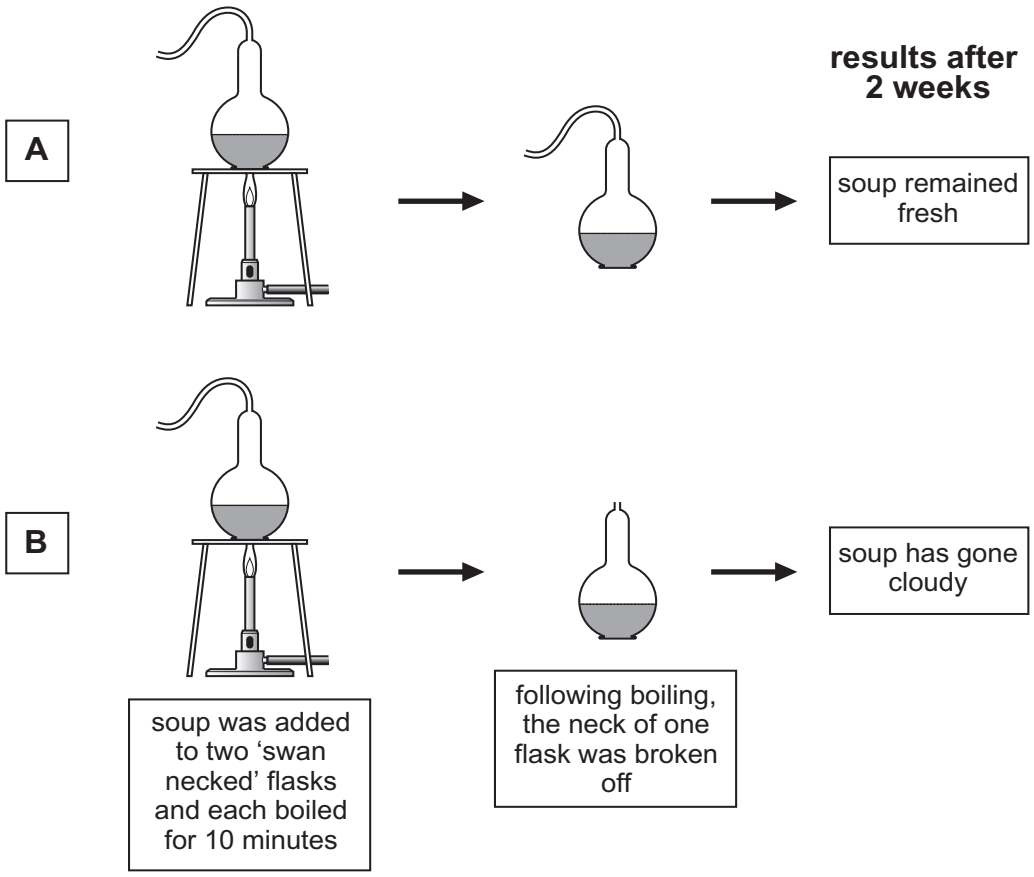
| Marks | Remark |
|---|---|
| | |



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|---|---|
| Marks | Remark |
| | |

**4** The following experiment was carried out in a science class.




*Adapted from: © GCSE biology for CCEA by R McIlwaine & J Napier, page 69, published by Hodder & Stoughton, 2003. ISBN 9780340858257. Reproduced by permission of Hodder Education*

**(a)** Suggest **one** reason why the soup was boiled for 10 minutes at the start of the experiment.

_____ [1]

**(b)** Explain fully the result for the soup in diagram A.

_____

_____ [2]

**(c)** Suggest two things that must be done to ensure that the results of this experiment are valid (fair test).

1. _____

2. _____ [2]

**(d)** Name the scientist who carried out a similar experiment using 'swan neck' flasks.

_____ [1]

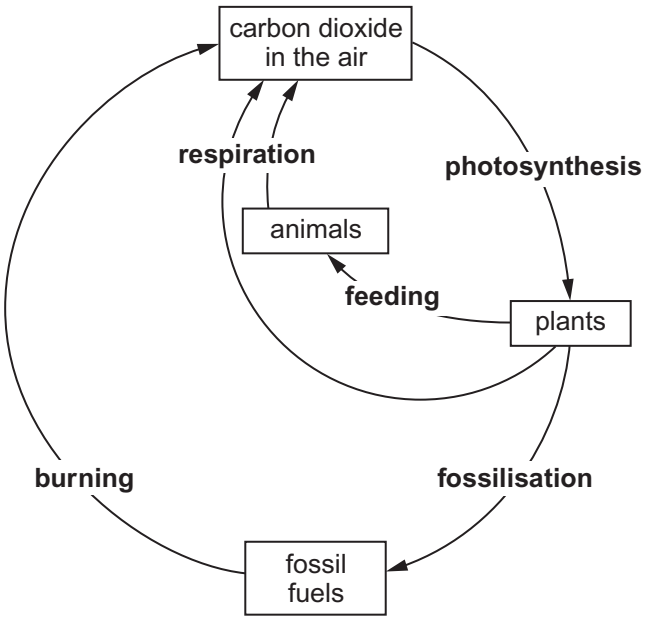


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|---|---|
| Marks | Remark |

**5** The following diagram shows part of the carbon cycle.

The processes are shown in **bold**.




**(a)** From the diagram, state **one** process that will not change carbon dioxide levels in the air.

_____ [1]

**(b)** Use the diagram and your knowledge to state **two** reasons why the level of carbon dioxide in the air is increasing.

_____

_____

_____ [2]

**(c)** Complete the following sentences.

Increasing levels of carbon dioxide cause _____ _____.

This, in turn, is causing problems such as decreasing ice fields and

changing _____ . [2]



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|---|---|
| Marks | Remark |
| | |

6 **Fig. A** shows newly emerged seedlings surrounding their parent tree.

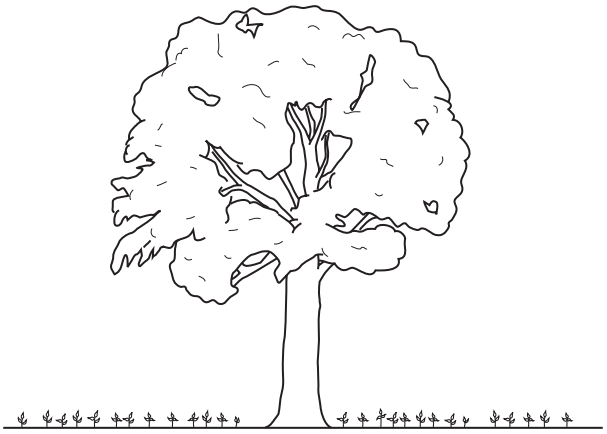


**Fig. A**

**Fig. B** shows the seedlings a year later under the same tree.

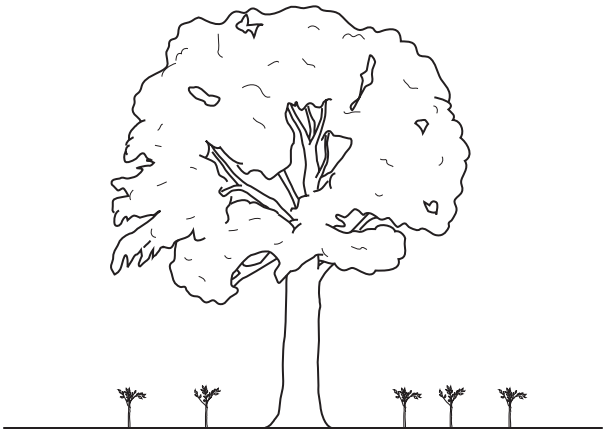


**Fig. B**

Describe and explain the differences in the number and distribution of seedlings between **Figs. A** and **B**.

_____

_____

_____

_____ [4]



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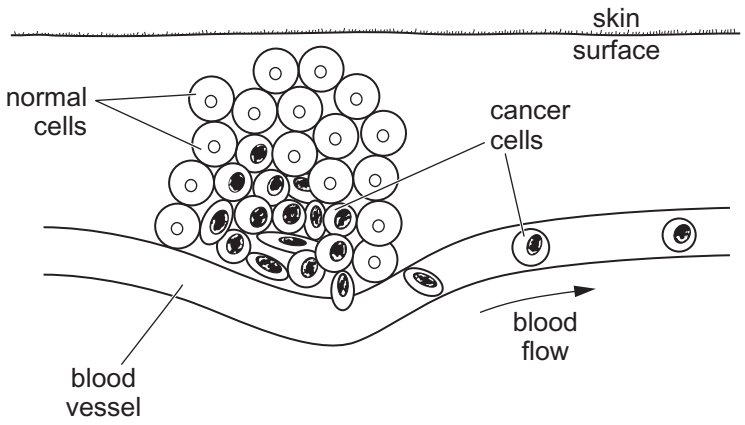
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| Marks | Remark |
| | |

**7** **(a)** The following diagram represents skin cancer.




**(i)** Use the diagram to suggest how cancer can spread to other parts of the body.

_____

_____ [1]

**(ii)** Explain how skin cancer cells develop.

_____

_____

_____

_____ [3]

**(iii)** Suggest one reason why the number of people from Northern Ireland getting skin cancer is increasing.

_____ [1]

**(b)** Name the condition caused by having one extra chromosome in **each** body cell.

_____ [1]



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|---|---|
| Marks | Remark |

**(c)** Siobhan is to visit Africa for the first time.

**(i)** Suggest why she should have a number of new vaccinations before travelling.

_____

_____

_____ [2]

**(ii)** Explain why these vaccinations have to be given several weeks before she goes on holiday.

_____ [1]

**(iii)** Suggest why vaccinations such as MMR are free but many travel vaccinations have to be paid for.

_____ [1]

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General Certificate of Secondary Education
2011–2012

# Science: Single Award (Modular)

## Human Activity and Health
## Module 2

## Foundation Tier

**[GSC21]**

**TUESDAY 8 NOVEMBER 2011**
**2.30 pm–3.15 pm**

# MARK SCHEME



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| | | | | | AVAILABLE MARKS |
|---|---|---|---|---|---|
| **1** | **(a)** | **(i)** | carbon monoxide; bronchitis | [2] | |
| | | **(ii)** | is addictive/affects/speeds up heart rate | [1] | |
| | **(b)** | | Cocaine ———— gives users a 'high'; cannabis ———— makes users feel relaxed | [2] | |
| | **(c)** | | stick to recommended limits; drink low alcohol drinks | [2] | 7 |
| **2** | **(a)** | | polio | [1] | |
| | **(b)** | **(i)** | antibodies | [1] | |
| | | **(ii)** | works quickly | [1] | |
| | **(c)** | | bacteria | [1] | |
| | **(d)** | | A | [1] | 5 |
| **3** | **(a)** | | B – A – C (all correct = 2; 1–2 correct = 1) | [2] | |
| | **(b)** | **(i)** | 3000 = 2 marks; 1 mark for at least one graph point correct | [2] | |
| | | **(ii)** | extinction | [1] | |
| | | **(iii)** | pollution | [1] | |
| | | **(iv)** | Any **two** from:<br>large numbers; over long period of time; sampled every five years | [2] | 8 |
| **4** | **(a)** | | to sterilise soup/apparatus/kill microbes | [1] | |
| | **(b)** | | no contamination/as microbes could not gain entry/microbes trapped; in bend/swan neck/cannot go up neck; | [2] | |
| | **(c)** | | Any **two** from:<br>left in same temperature; same volume/type of soup; left for same time | [2] | |
| | **(d)** | | Pasteur | [1] | 6 |
| **5** | **(a)** | | fossilisation/feeding | [1] | |
| | **(b)** | | **more** combustion; **less** photosynthesis/deforestation | [2] | |
| | **(c)** | | global warming; climates/sea levels/weather | [2] | 5 |

| | | | AVAILABLE MARKS |
|---|---|---|---|
| **6** | fewer seedlings; not as close together/more spread; some died/didn't grow; due to competition/for light/water/space/minerals/nutrients [4] | | 4 |
| **7** | **(a)** **(i)** through the blood system [1] | | |
| | **(ii)** Any **three** from:<br>mutations; in chromosome/genes/DNA; divide uncontrollably;<br>due to UV light [3] | | |
| | **(iii)** (more) continental holidays/(more) sun bed use [1] | | |
| | **(b)** Down syndrome [1] | | |
| | **(c)** **(i)** new different/foreign diseases/antigens; does not have antibodies/memory cells [2] | | |
| | **(ii)** for antibody level (to build up)/reach immunity level [1] | | |
| | **(iii)** choice/not needed if not travelling/travel is luxury/not everyone goes on holiday [1] | | 10 |
| | | **Total** | **45** |

Rewarding Learning

Centre Number

| 71 | |
|---|---|

Candidate Number

| |
|---|
| |

General Certificate of Secondary Education
2010–2011

# Science: Single Award (Modular)

## Human Activity and Health
## Module 2

## Foundation Tier

**[GSC21]**

GSC21

**FRIDAY 20 MAY 2011, MORNING**

**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 seven** 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 | |
| 7 | |
| Total Marks | |



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| Examiner Only | |
|---|---|
| Marks | Remark |
| | |

**1** **(a)** Complete the following table about pollution.

Choose from:

**land : water : recycle : filters on factory chimneys**

| Type of pollution | Example | Method to reduce amount of pollution |
|---|---|---|
| air | acid rain | |
| | household waste | |

[3]

**(b)** Complete the following sentences.

Choose from:

**large : small : decommissioning : over-fishing : quotas**

Our fish stocks are at risk due to pollution and also by

_____ .

Fish stocks can be protected by using fishing nets with

_____ mesh sizes.

[2]

**(c)** The rapid increase in human population size also harms our planet. One of the reasons why the human population is increasing so fast is that people are living longer.

Suggest two reasons why people are living longer.

1. _____ [1]

2. _____ [1]

| Examiner Only | |
|---|---|
| Marks | Remark |
| | |

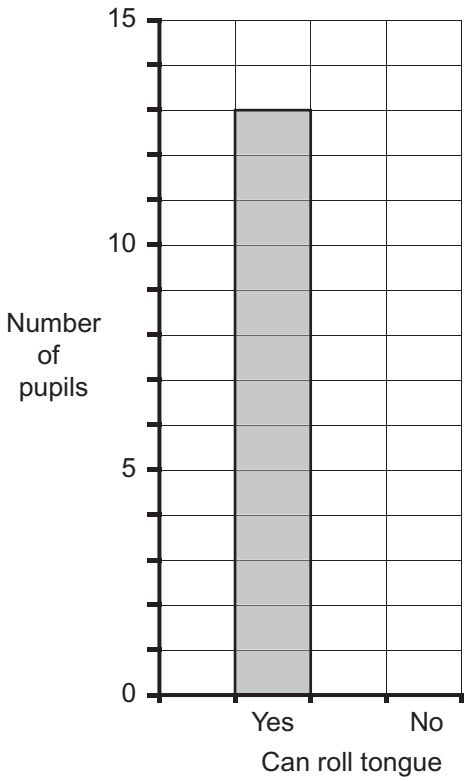
**2** **(a)** Variation in living things can be either continuous or discontinuous. Using lines, link each type of variation to one example.

| Type of variation | Example |
|---|---|
| continuous | height |
| | mutation |
| discontinuous | tongue rolling |

[2]

**(b)** Jane is in a class of **20** pupils. She is one of 13 who can roll their tongues.

Complete the bar chart below to show how many pupils cannot roll their tongue.




[1]

| Examiner Only | |
|---|---|
| Marks | Remark |
| | |

**3** **(a)** Cigarette smoke contains harmful substances that can cause death.

**(i)** Suggest why some people still smoke even though they know it is harmful.

_____ [1]

**(ii)** Name **one** harmful substance in cigarette smoke and explain how it harms the body.

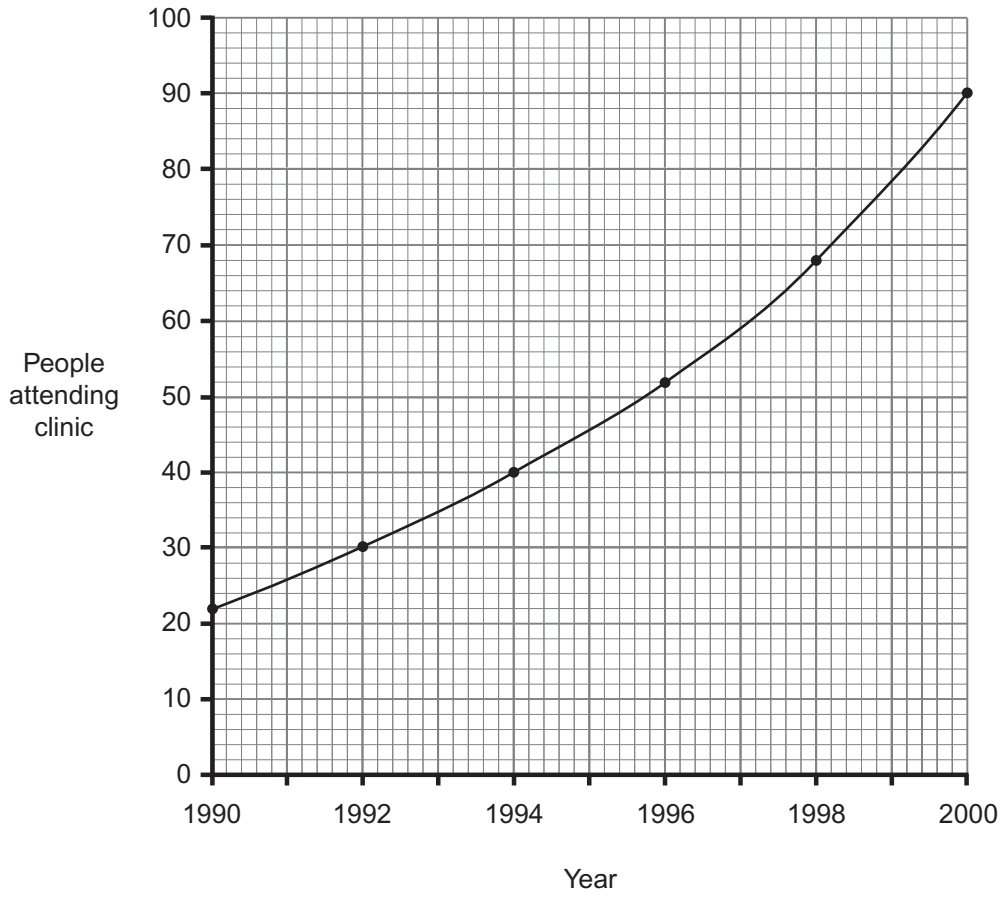
Name of harmful substance

_____ [1]

Explanation of how it causes harm _____

_____ [1]

**(b)** The following graph shows the number of people attending a clinic for drug **addiction** over a 10 year period.



**(i)** Calculate the increase in the number attending the clinic from 1990 to 2000.

**Show your working**.

_____ [2]

**(ii)** Suggest why most of the people attending were cocaine rather than cannabis users.

_____ [1]

| Examiner Only | |
|---|---|
| Marks | Remark |
| | |

| Examiner Only | |
|---|---|
| Marks | Remark |

**4** **(a)** In 1928 Alexander Fleming discovered that if bacteria growing in a Petri dish were contaminated with a particular type of fungus the bacteria stopped growing.



*© Science Photo Library*

This substance was eventually purified to become the first antibiotic.

**(i)** Name the antibiotic developed from this fungus.

_____ [1]

**(ii)** Name the type of organism that can be killed by an antibiotic.

Choose from:

**virus** **bacteria** **fungi**

_____ [1]

**(iii)** Give **one** example of a disease caused by this type of organism.

_____ [1]

**(b)** MRSA is sometimes called a 'superbug' and is a problem in many hospitals because it is difficult to destroy.

Give two things that can be done to help reduce the spread of MRSA in hospitals.

1. _____ [1]

2. _____ [1]

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**(Questions continue overleaf)**


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| Examiner Only | |
|---|---|
| Marks | Remark |

**5** **(a)** There is increasing evidence that global warming is happening and is harming our planet.

**(i)** Circle the **two** statements below that have helped convince many people that global warming is occurring.

**ice caps are increasing in size**

**the world climate is changing**

**the temperature of the atmosphere is increasing**

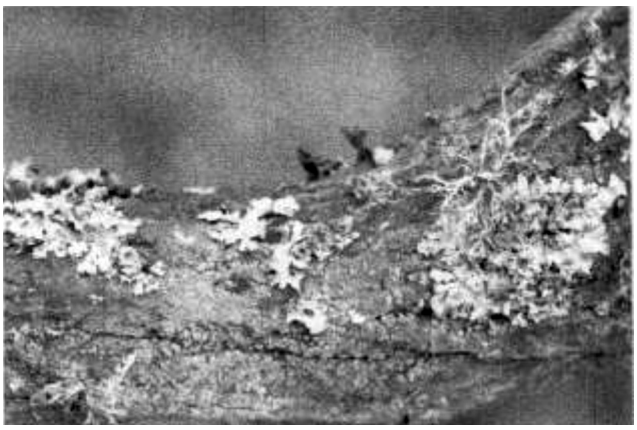
**nitrate levels are increasing**

[2]

**(ii)** Name **one** gas that is thought to be responsible for global warming.

_____ [1]

**(b)** The environment can be monitored through counting the number of lichens growing on trees.



*© Wildscape/Alamy*

Lichen is an example of a biotic factor.

**(i)** What is meant by a biotic factor?

Choose from:

**non-living : chemical : living**

_____ [1]

John investigated the number of lichen plants on ash trees at different distances from two towns (Leafyacre and Coalville).
He only counted lichens up to 2 metres from ground level and only 5 trees at each distance.

His results are shown in the table below.

| | Average number of lichens on each tree | |
|---|---|---|
| **Distance from town centre/km** | **Leafyacre** | **Coalville** |
| 0 | 5 | 0 |
| 5 | 7 | 2 |
| 10 | 7 | 3 |
| 15 | 8 | 4 |
| 20 | 8 | 5 |

Lichens do not grow in very industrial (polluted) areas and grow best when pollution levels are low.

**(ii)** Give **one** similarity between the results for Leafyacre and Coalville.

_____ [1]

**(iii)** Describe **one** difference between the results for the two towns. Suggest an explanation for this difference.

Difference _____ [1]

Explanation _____ [1]

**(iv)** Use the information provided to give two things that John did to ensure he got valid results (fair test).

1. _____ [1]

2. _____ [1]

**(v)** State **one** thing John could have done to increase the reliability of his results.

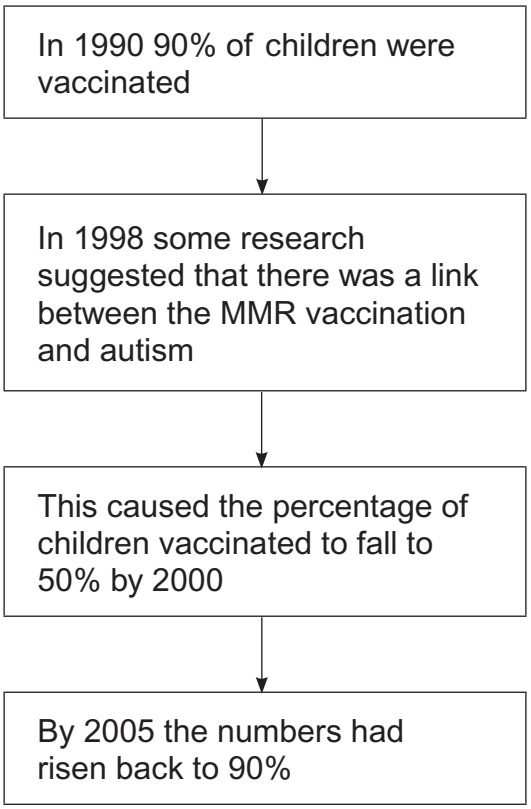
_____ [1]

Examiner Only

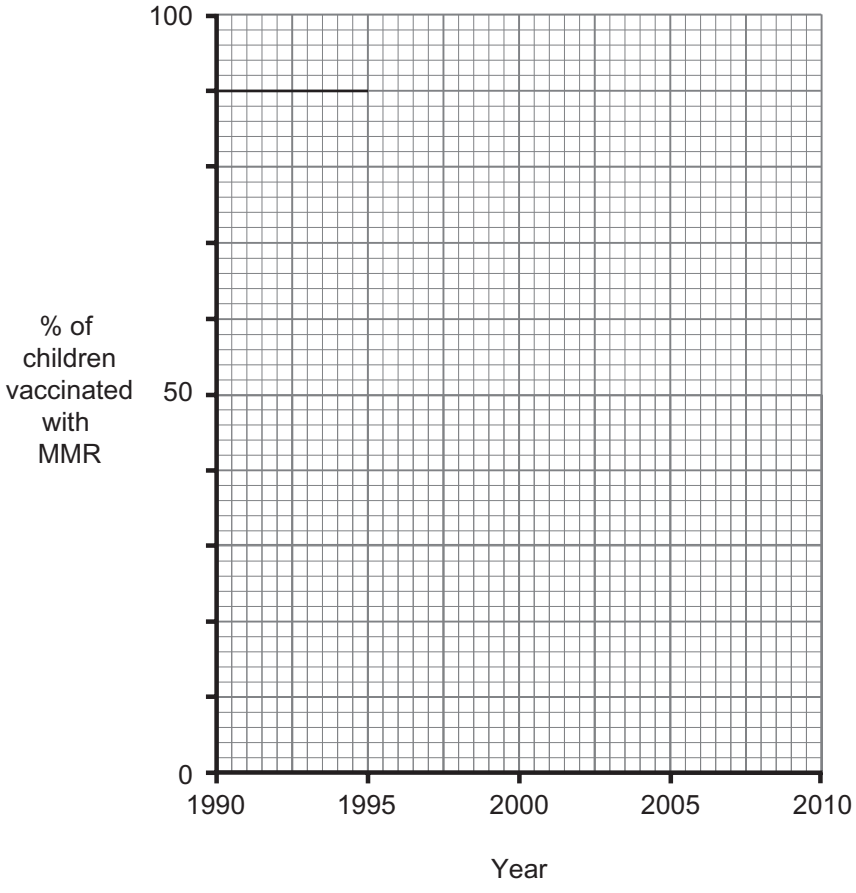
| Marks | Remark |
|---|---|
| | |

| Examiner Only | |
|---|---|
| Marks | Remark |
| | |

**6** **(a)** The following flowchart outlines how the number of children being vaccinated for MMR changed between 1990 and the present.




**(i)** Use the information provided to complete the graph below to show the change in percentage of children being vaccinated.




[2]



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**(ii)** Explain why the percentage of children being vaccinated for MMR has returned to the 1990 level.

_____ [1]

**(b)** Explain how the following help defend against harmful microbes.

Mucous membranes in the nasal cavity _____

_____ [1]

Blood clotting _____

_____ [1]

**(c)** Explain how antibodies protect against disease.

_____

_____

_____

_____ [3]

Examiner Only

| Marks | Remark |
|---|---|
| | |

| Examiner Only | |
|---|---|
| Marks | Remark |

**7** **(a)** The primrose plant used to be very common in Northern Ireland; it has pretty flowers and people picked them in large numbers. It grows best in natural unfertilised grassland where it is not in the shade of other plants.



© CCEA

Its numbers have decreased for a number of reasons including the use of fertiliser to increase grass growth for cattle.

**(i)** Explain fully how the widespread use of fertiliser could lead to a reduction in primroses.

_____

_____ [2]

**(ii)** Apart from reducing the use of fertiliser on grassland, suggest **two** things that can be done to help protect the primroses from extinction.

_____

_____

_____ [2]

**(b)** Name **one** other endangered species and suggest one reason why it is at risk of extinction.

_____

_____ [2]

## THIS IS THE END OF THE QUESTION PAPER

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General Certificate of Secondary Education
2010–2011

# Science: Single Award (Modular)

## Human Activity and Health
## Module 2

## Foundation Tier

**[GSC21]**

**FRIDAY 20 MAY 2011, MORNING**

# MARK SCHEME



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| AVAILABLE MARKS |
|---|

**1 (a)**

| Type of pollution | Example | Method to reduce amount of pollution |
|---|---|---|
| air | acid rain | filters on factory chimneys |
| land | household waste | recycle |

[3]

**(b)** over-fishing – large [2]

**(c)** better health care; better nutrition; better sanitation (any **two**) [2] — 7

**2 (a)** continuous ⟶ height; discontinuous ⟶ tongue rolling; [2]

**(b)** accurate bar [1] — 3

**3 (a) (i)** experimentation/peer pressure/addicted/enjoyment/stress [1]

**(ii)** tar; causes cancer/bronchitis/emphysema **or**
nicotine; is addictive/speeds up heart rate **or**
carbon monoxide; reduces oxygen carrying capacity of the blood [2]

**(b) (i)** 68 [If 69 and working out shown = 1 mark] [2]

**(ii)** cocaine *more* addictive/more people using cocaine [1] — 6

**4 (a) (i)** penicillin [1]

**(ii)** bacteria [1]

**(iii)** gonorrhoea/salmonella/tuberculosis/other example/MRSA [1]

**(b)** good hygiene or named example; isolate patients with MRSA; not over-using antibiotics (any **two**) [2] — 5

**5 (a) (i)** changing climates; the temperature of the atmosphere is increasing [2]

**(ii)** carbon dioxide/methane [1]

| | | | | AVAILABLE MARKS |
|---|---|---|---|---|
| | **(b)** | **(i)** | living [1] | |
| | | **(ii)** | lichens increase *away from city centre* [1] | |
| | | **(iii)** | numbers lower in Coalville/greater increase away from centre in Coalville; more pollution in Coalville/more factories [2] | |
| | | **(iv)** | same distances used in two cities/5 trees used/counted up to 2 metres/same type of tree (any **two**) [2] | |
| | | **(v)** | more trees/greater area of tree/more distances used/different times of year [1] | 10 |
| **6** | **(a)** | **(i)** | graph showing fall after 1998; to 50%; then rise to 90% by 2005 (all 3 points correct = 2; 1 or 2 points correct = 1) [2] | |
| | | **(ii)** | link with autism proved false/there is no link [1] | |
| | **(b)** | | mucous membranes ⟶ *traps* microbes [1]<br>blood clotting ⟶ prevents entry of microbes [1] | |
| | **(c)** | | antibodies produced when having been infected/vaccinated/ by lymphocytes/white blood cell/complementary shape to microbe/ antigen/can fit together;<br>antibody antigen link/attach/latch on;<br>microbes immobilised/clump;<br>memory cells (any **three**) [3] | 8 |
| **7** | **(a)** | **(i)** | grass grows rapidly/tall; outcompetes/covers primrose/stops light [2] | |
| | | **(ii)** | laws to prevent them being picked/don't pick;<br>create new habitats; conserve current habitats (any **two**) [2] | |
| | **(b)** | | any example, e.g. panda with reason, e.g. habitat destruction [2]<br>[second mark only if first mark correct] | 6 |
| | | | **Total** | **45** |

Rewarding Learning

Centre Number

| 71 | |
|---|---|

Candidate Number

| |
|---|
| |

General Certificate of Secondary Education
2010–2011

# Science: Single Award (Modular)

## Human Activity and Health
## Module 2

## Foundation Tier

**[GSC21]**

GSC21

**THURSDAY 24 FEBRUARY 2011, MORNING**

**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 seven** 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 | |
| 7 | |
| Total Marks | |



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| Examiner Only | |
|---|---|
| Marks | Remark |
| | |

**1** **(a)** Cigarette smoke contains substances that have harmful effects on the body. Complete the following table.

Choose from:

**nitrogen : tar : is addictive**

**causes bronchitis : carbon monoxide**

| Substance | Harmful effect |
|---|---|
| nicotine | |
| | causes cancer |
| | lowers the level of oxygen in blood |

[3]

**(b)** **(i)** Complete the following sentences.

Choose from:

**eyes : liver : binge drinking : a hangover**

Drinking a lot of alcohol in a short period of time

is called _____.

People who drink too much alcohol for a long period of time risk

harming their _____. [2]

**(ii)** Apart from giving up alcohol, suggest two ways to reduce the harm that it can cause to the body.

1. _____

2. _____ [2]

**(iii)** State one way that excess drinking of alcohol can harm **society**.

_____ [1]



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| Examiner Only | |
|---|---|
| Marks | Remark |

**2** **(a)** Complete the following flow chart.

Choose from:

**genes : cancer : measles**

**protein : gamma : UV**

Skin becomes tanned (burned)

because of _____ rays from the Sun.

↓

This can cause damage to

the _____ in our skin cells.

↓

Eventually this may cause _____.

[3]

**(b)** Suggest **one** reason why the number of cases of skin cancer in Northern Ireland is rising.

_____ [1]

**(c)** Complete the following sentence.

Choose from:

**controlled cell division : uncontrolled cell division :**

**uncontrolled growth of cell size**

Cancer is _____ [1]



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**3 (a)** Below is a picture of a corncrake in tall vegetation where it nests.

| Examiner Only | |
|---|---|
| Marks | Remark |



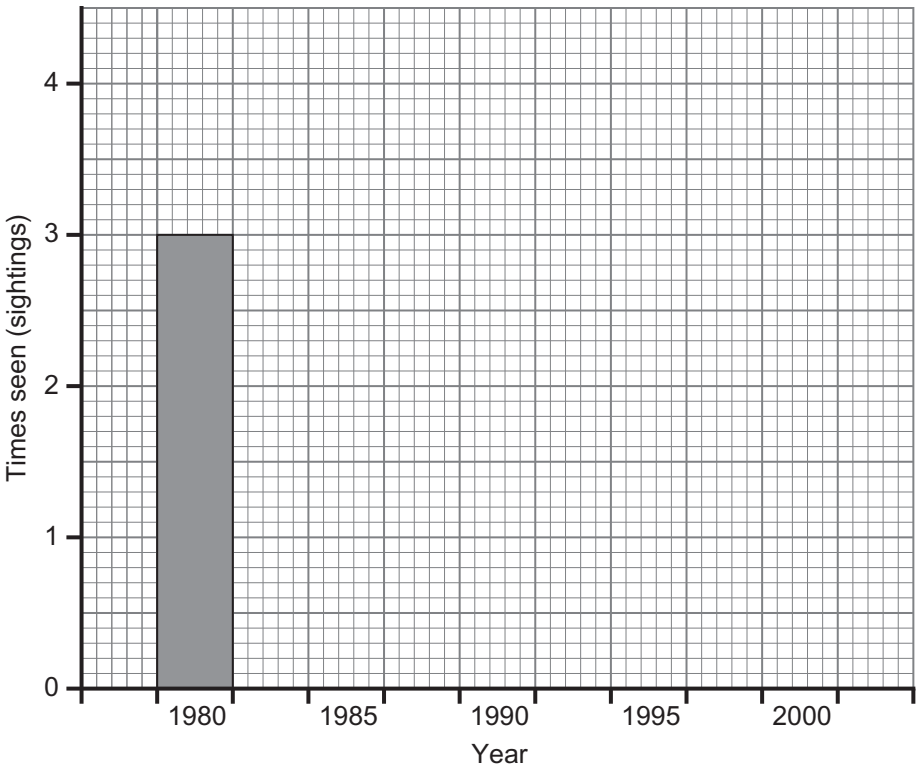
*© Michael Callan/Frank Lane Picture Agency/CORBIS*

A farmer noted the following information about corncrakes on his land.

| Year | Times seen (sightings) | Times heard (calls) |
|---|---|---|
| 1980 | 3 | 12 |
| 1985 | 2 | 5 |
| 1990 | 2 | 6 |
| 1995 | 1 | 4 |
| 2000 | 1 | 4 |

Use the information provided and your knowledge to answer parts **(i)**, **(ii)** and **(iii)** below.

**(i)** Complete the following bar chart showing the number of sightings.




[2]

**(ii)** Suggest **one** reason why the information shows that there were more corncrake calls than sightings.

_____ [1]

**(iii)** Give **one** piece of evidence that suggests that the corncrake is an endangered species.

_____ [1]

**(b)** The corncrake is an example of a biotic factor that can be used to give information about the environment.

What is meant by a **biotic** factor?

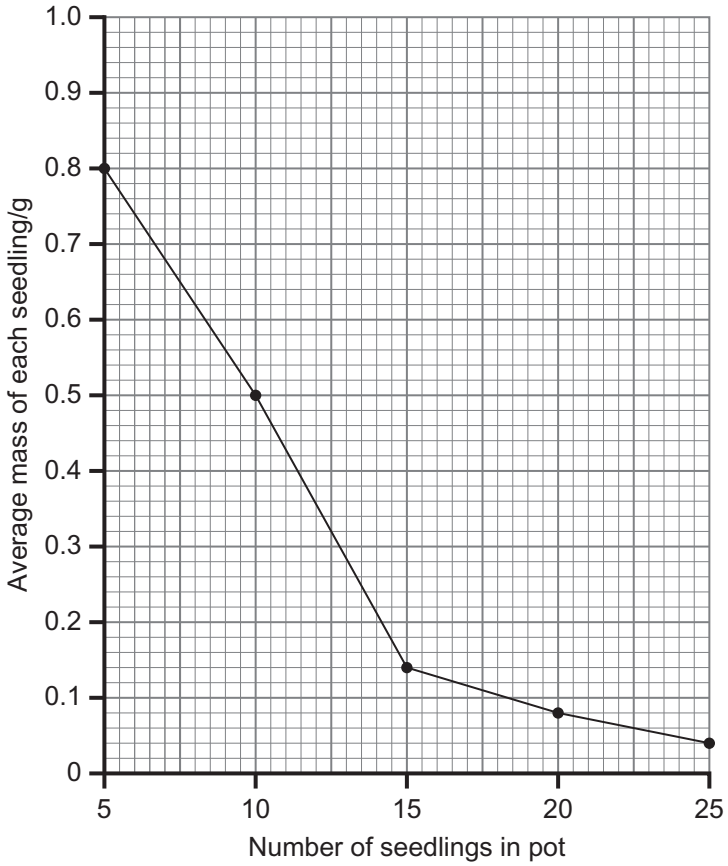
_____ [1]

Examiner Only

| Marks | Remark |
|---|---|
| | |

| Examiner Only | |
|---|---|
| Marks | Remark |

**4** **(a)** Jane was given five identical pots and a packet of seeds. She used these to investigate how the mass of seedlings was affected by the number growing in each pot. She planted the seeds and after three weeks weighed the seedlings. This is a graph of her results.




**(i)** Calculate the total number of seedlings that Jane used.

Show your working.

_____ [2]

**(ii)** Explain fully why the average mass of the seedlings decreased with more seedlings in each pot.

_____

_____ [2]

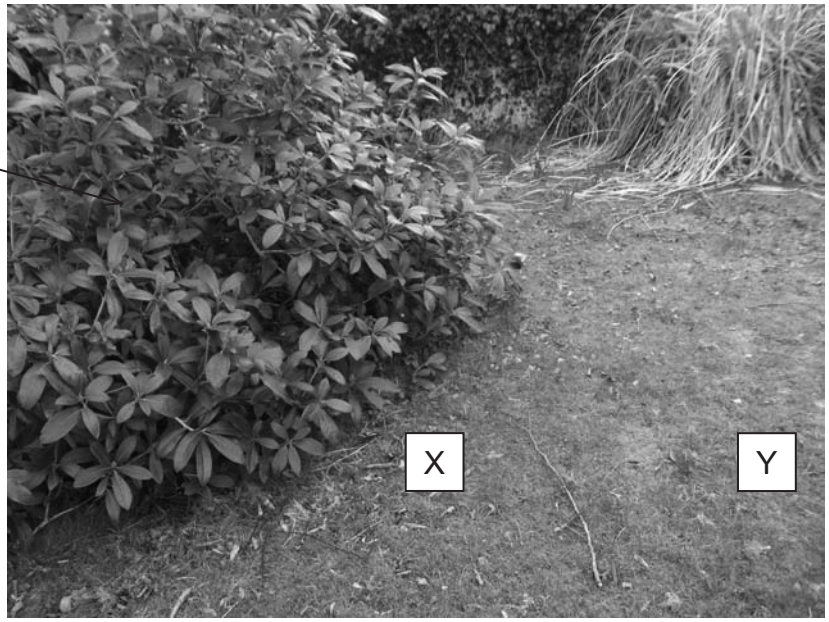
**(iii)** From the information state two things Jane did to make her investigation valid (a fair test).

1. _____

2. _____ [2]

**(b)** The rhododendron is a competitive invasive species common in many gardens.

The following photograph shows a rhododendron in Ben's garden.




**(i)** Ben is hoping to plant some daffodils in his garden. Explain fully why he should plant them at position Y rather than X.

_____

_____

_____ [2]

**(ii)** Name **one** other competitive invasive species.

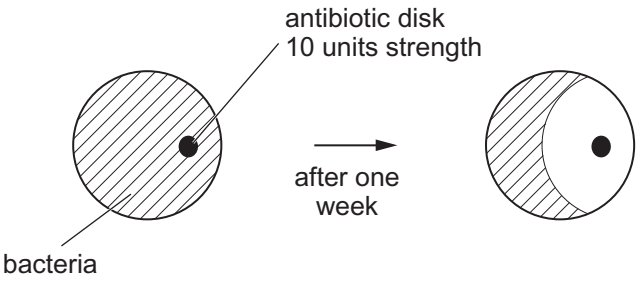
_____ [1]

Examiner Only

| Marks | Remark |
|---|---|
| | |

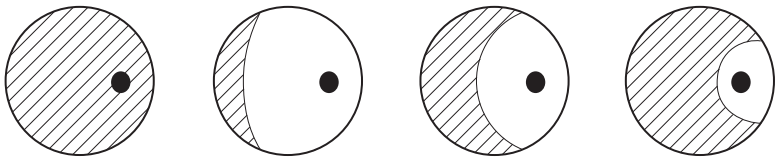
| Examiner Only | |
|---|---|
| Marks | Remark |

**5** **(a)** The following diagram shows the effect of placing a 10 unit antibiotic disk on a Petri dish containing bacteria.




**(i)** The experiment was repeated with an antibiotic of 5 units.

Which of the following diagrams would be the expected result?




Answer (A, B, C or D) _____ [1]

**(ii)** Name the antibiotic discovered by the accidental contamination of a Petri dish containing bacteria.

_____ [1]

**(iii)** Name **one** disease caused by bacteria.

_____ [1]

**(b)** Poor hygiene standards in hospitals can speed up the spread of MRSA.
Suggest **one** reason why MRSA is difficult to eliminate from hospitals even when hygiene standards are very high.

_____

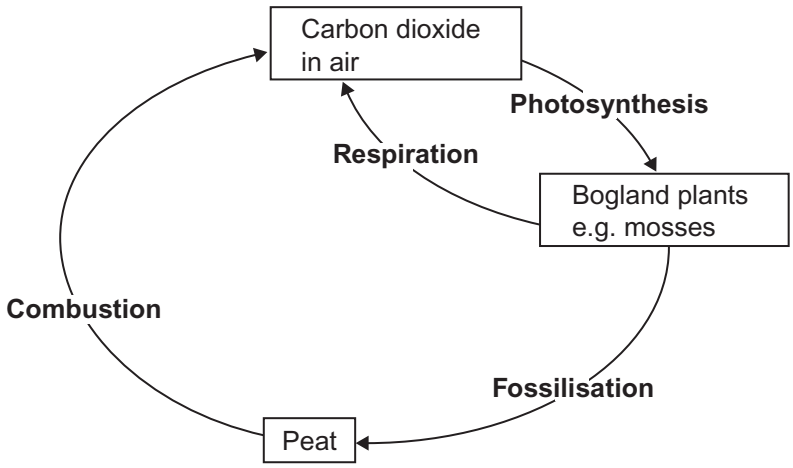
_____ [1]



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| Examiner Only | |
|---|---|
| Marks | Remark |

**6** The following diagram shows the role peat (a fossil fuel) plays in the carbon cycle.




**(a)** Name **two** processes in the diagram that return carbon dioxide to the air.

_____ and _____ [2]

**(b)** Using the diagram and your knowledge explain what causes global warming.

_____

_____

_____ [2]

Another fuel is the willow plant which grows rapidly and can be harvested after three years.

**(c)** Use the information provided and your knowledge to explain why using willow, rather than peat, is better for the environment.

_____

_____

_____

_____

_____ [3]

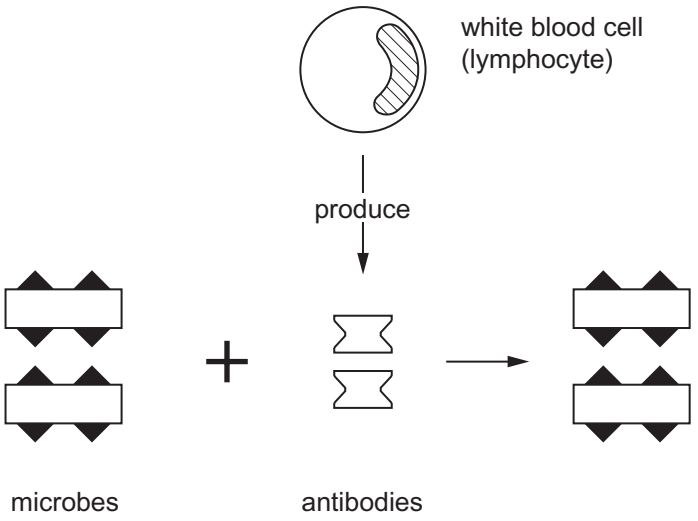


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|---|---|
| Marks | Remark |
| | |

**7** **(a)** When microbes enter our body some blood cells produce antibodies. The antibodies work by clumping the microbes together and immobilising them. This is called active immunity.

**(i)** Complete the diagram to show how the antibodies cause the microbes to clump together.




[1]

**(ii)** Name the process by which the clumped microbes are destroyed.

_____ [1]

**(iii)** Suggest why we have different antibodies for each type of disease.

_____ [1]

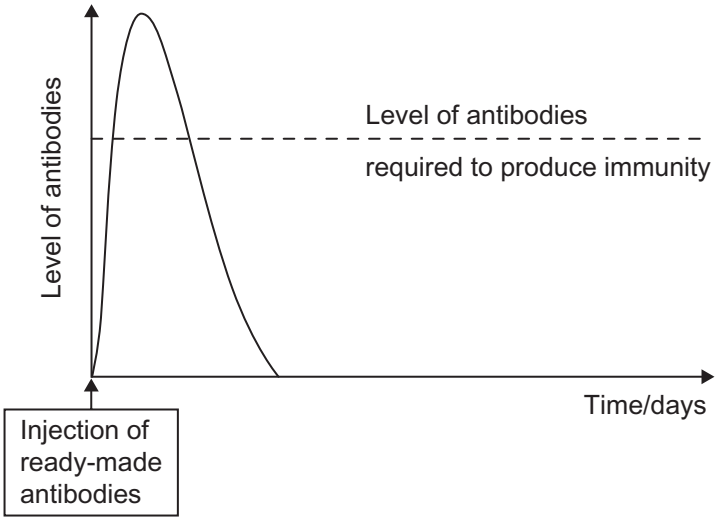


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|---|---|
| Marks | Remark |

**(b)** We can also protect ourselves by having antibodies injected directly into the body. This will give us **passive** immunity.

The following graph shows how the number of antibodies in the blood changes during passive immunity.




Use the graph and your knowledge to describe two ways in which passive immunity differs from active immunity.

1. _____

2. _____ [2]

**(c)** Many people in Britain have an annual flu vaccination at the start of winter. This is to prevent them catching the flu over the winter season.

Explain fully why a vaccination is used rather than having the antibodies injected directly into the body.

_____

_____ [2]

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Rewarding Learning

General Certificate of Secondary Education
February 2011

# Science: Single Award (Modular)

## Human Activity and Health
## Module 2

Foundation Tier

**[GSC21]**

**THURSDAY 24 FEBRUARY 2011, MORNING**

# MARK SCHEME



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| | | | AVAILABLE MARKS |
|---|---|---|---|
| **1** | **(a)** | | |

| Substance | Harmful effect |
|---|---|
| | is addictive |
| tar | |
| carbon monoxide | |

[3]

**(b)** **(i)** binge drinking; liver [2]

**(ii)** drink less on each occasion/drink on fewer occasions/ education/seek help
Any **two** [2]

**(iii)** violence/relationship problems/work/school problems/cost to NHS/accidents due to drunk driving/antisocial behaviour/crime [1] — 8

**2** **(a)** UV – genes – cancer [3]

**(b)** sunny/continental holidays/tanning studios [1]

**(c)** uncontrolled cell division [1] — 5

**3** **(a)** **(i)** 4 correct [2], 2/3 correct [1] [2]

**(ii)** corncrake difficult to see [1]

**(iii)** numbers falling/numbers low [1]

**(b)** living/biological [1] — 5

**4** **(a)** **(i)** 5 + 10 + 15 + 20 + 25; 75 [2]

**(ii)** fighting/competition; for light/space/water/nutrients [2]

**(iii)** same pots/same length of time/same seed/[not plants]/seedlings [2]

**(b)** **(i)** roots produce poisonous substances/rhododendron will spread; damage/kill plants at X/or explain how, e.g. less light/less water/ nutrients [2]

**(ii)** grey squirrel/zebra mussel [1] — 9

| | | | | AVAILABLE MARKS |
|---|---|---|---|---|
| **5** | **(a)** | **(i)** D | [1] | |
| | | **(ii)** penicillin | [1] | |
| | | **(iii)** gonorrhoea/salmonella/tuberculosis/MRSA | [1] | |
| | **(b)** | ill people in close proximity/weakened immune systems/ open wounds/antibiotic resistance [principle of antibiotics won't work] | [1] | 4 |
| **6** | **(a)** | combustion; respiration | [2] | |
| | **(b)** | **increase** in combustion/**reduction** in photosynthesis; carbon dioxide levels increase/trap heat/rays | [2] | |
| | **(c)** | **willow** renewable; takes in carbon dioxide; during photosynthesis; so no increase/reduced increase/carbon dioxide/carbon neutral Any **three** **or** **peat** not renewable; doesn't take in carbon dioxide; from photosynthesis; so increases carbon dioxide/global warming Any **three** | [3] | 7 |
| **7** | **(a)** | **(i)** antibodies linked accurately to microbes/antigens | [1] | |
| | | **(ii)** phagocytosis | [1] | |
| | | **(iii)** each disease-causing microbe/antigen different shape | [1] | |
| | **(b)** | passive immunity is faster acting; lasts short period of time; antibodies not produced by body Any **two** | [2] | |
| | **(c)** | vaccination lasts throughout winter/longer; flu could strike at any time over the winter | [2] | 7 |
| | | | **Total** | **45** |



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Centre Number

| 71 | |
|---|---|

Candidate Number

| |
|---|
| |

General Certificate of Secondary Education
2010–2011

# Science: Single Award (Modular)

## Human Activity and Health
## Module 2
## Foundation Tier

**[GSC21]**

GSC21

**THURSDAY 11 NOVEMBER 2010, AFTERNOON**

**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 seven** 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 | |
| 7 | |
| Total Marks | |



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| Examiner Only | |
|---|---|
| Marks | Remark |
| | |

**1** **(a)** Complete the table below about microbes that cause disease.

Choose from:

**virus** **gonorrhoea** **thrush** **polio**

| Type of microbe | Disease |
|---|---|
| bacteria | |
| | cold |
| fungi | |

[3]

**(b)** Complete the following sentences.

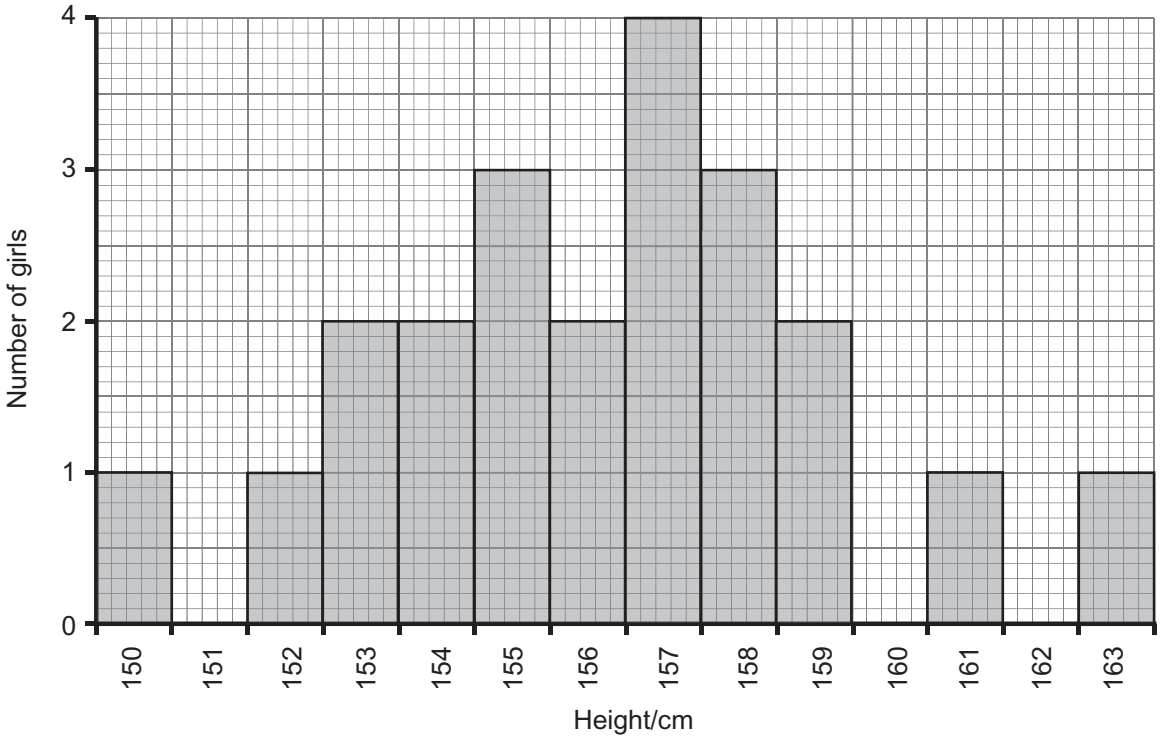
Choose from:

**blood clotting : mucous membrane : skin : vaccination**

The body is completely covered by _____ which is an important barrier to microbes. If this barrier gets damaged it is repaired by _____ [2]

| Examiner Only | |
|---|---|
| Marks | Remark |

**2** **(a)** The graph below shows the heights of a class of 15-year-old girls.




**(i)** What is the most common height in the class?

_____ cm [1]

**(ii)** How many girls are 161 cm in height?

_____ [1]

**(iii)** Height is an example of continuous variation in humans. What is meant by the term **continuous variation**?

_____ [1]

**(b)** Give an example of **discontinuous** variation in humans.

**Circle** the correct answer.

**weight** : **finger length** : **tongue rolling**

[1]

**(c)** We can change the colour of our skin by getting a tan.

**(i)** Give **one** reason why some people like to be tanned.

_____ [1]

**(ii)** Give **one** disadvantage of getting a tan.

_____ [1]

| Examiner Only | |
|---|---|
| Marks | Remark |
| | |



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| Examiner Only | |
|---|---|
| Marks | Remark |

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

**(i)** Give **two** reasons why people are living longer.

Choose from:

**more pollution : better diets : better medical care : more immigration**

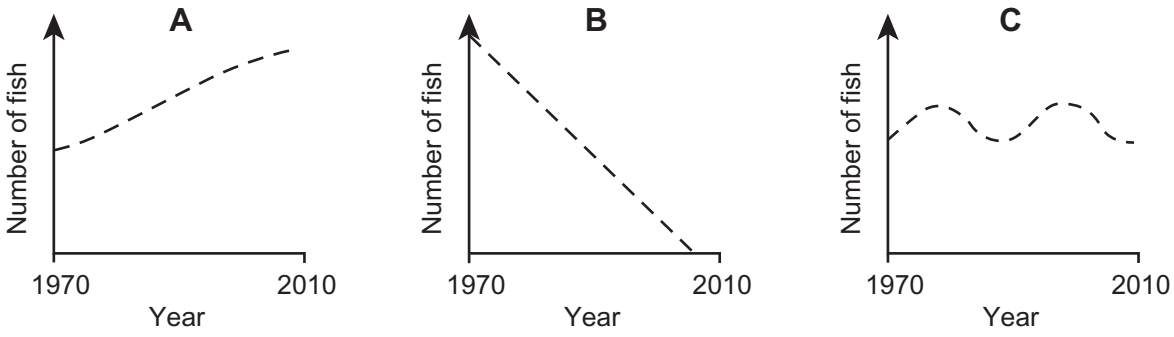
1. _____ [1]

2. _____ [1]

**(ii)** Suggest **one** disadvantage of an increase in population.

_____ [1]

**(b)** The following graphs show how the numbers of three types of fish (A, B and C) have changed in the last 40 years.




**(i)** Which type of fish **(A, B or C)**:

- have sustainable numbers?

_____ and _____ [1]

- may be extinct?

_____ [1]

**(ii)** Give **one** way that overfishing has been reduced and explain how it helps sustain fish stocks for the future.

_____

_____

_____ [2]

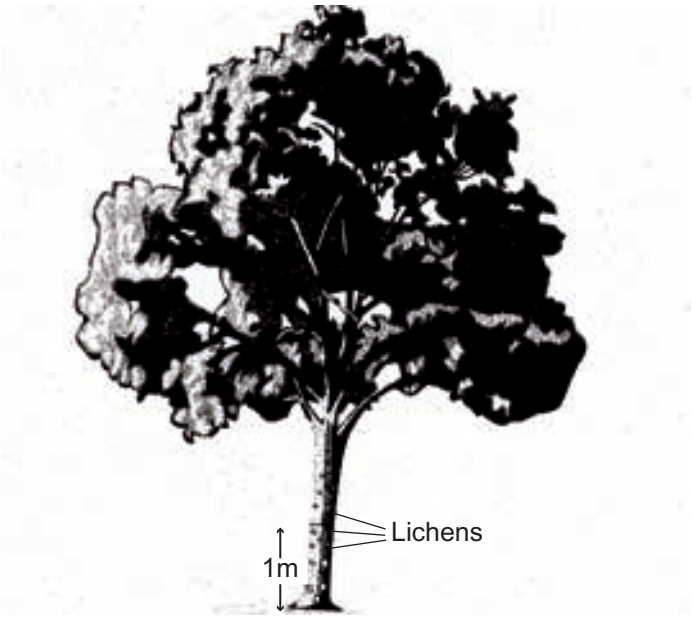


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| Examiner Only | |
|---|---|
| Marks | Remark |
| | |

**4** **(a)** A class of students investigated the number of lichens growing on a tree trunk in a wood.

They only counted up to 1m as shown below.

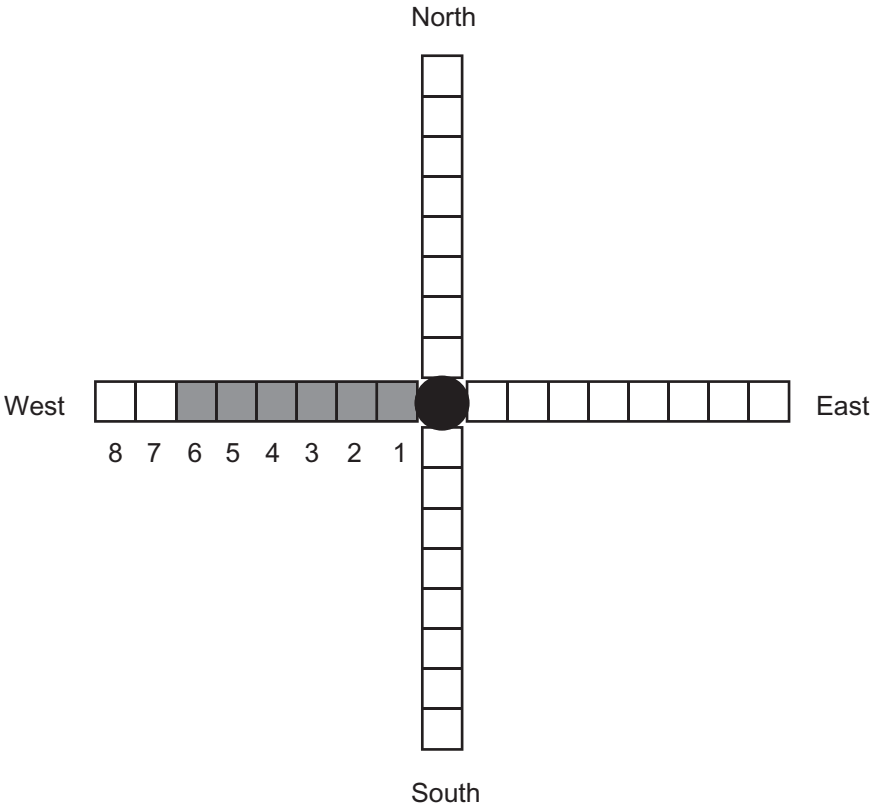



They recorded which side of the tree the lichen was found. The results are shown below.

| Side of tree | Number of lichens |
|---|---|
| North | 7 |
| East | 2 |
| South | 1 |
| West | 6 |

| Examiner Only | |
|---|---|
| Marks | Remark |

**(i)** Complete the chart **below** to show the number of lichens on each side.




[2]

**(ii)** Complete the following sentence giving a trend shown by the results.

The results show that the lichen grows best on the

_____ side of the tree. [1]

**(iii)** Suggest two **abiotic** (physical) factors that could have affected the distribution of the lichens on the trees.

1. _____ [1]

2. _____ [1]

**(iv)** Use the information given to suggest **two** ways in which the reliability of the survey could be improved.

_____

_____ [2]

**(b)** Suggest what would happen to the number of lichens in the woodland if an industrial estate was built nearby.

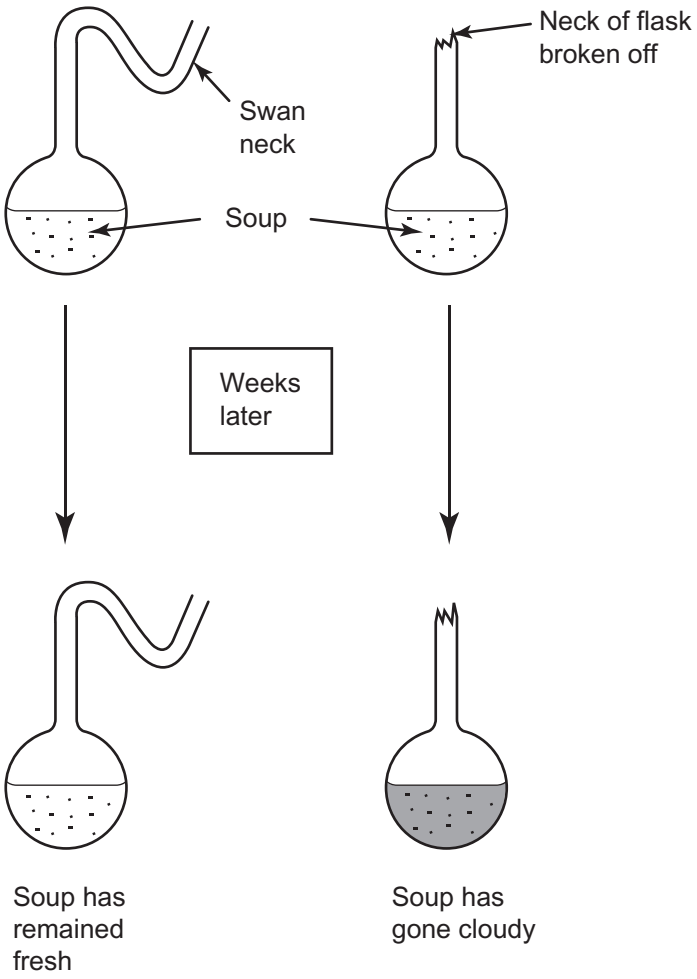
_____ [1]



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| Examiner Only | |
|---|---|
| Marks | Remark |
| | |

**5** The following diagram shows the apparatus Louis Pasteur used to show that contamination of food was caused by microbes from the air.




**(a)** Describe the results of Pasteur's experiment and explain how it showed that food contamination was caused by microbes from the air.

_____

_____

_____

_____ [3]

**(b)** State **two** things that Pasteur must have done to ensure that he got valid results (a fair test).

1. _____ [1]

2. _____ [1]



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| Examiner Only | |
|---|---|
| Marks | Remark |

**6** **(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]

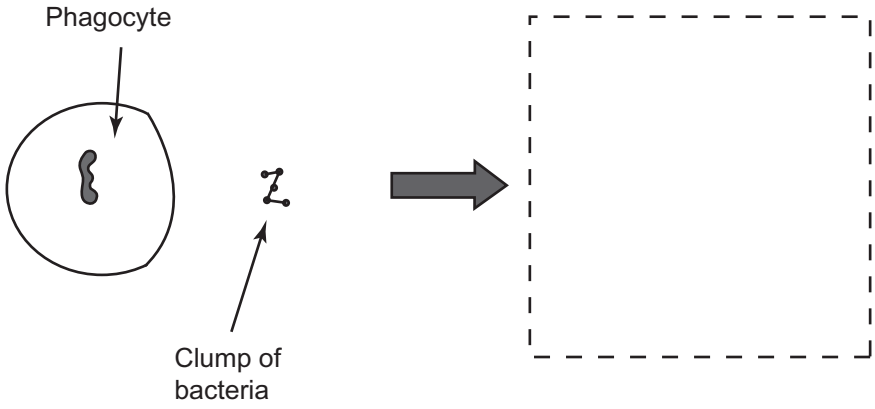
**(ii)** Suggest why it is important that antibiotics are not overused.

_____ [1]



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**(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 |
|---|---|
| | |



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| Examiner Only | |
|---|---|
| Marks | Remark |

**7** Willow is a fast growing biofuel that can be harvested after as little as three years growth.

**(a)** Explain fully why the use of willow as a biofuel is an example of **sustainable** development.

_____

_____ [2]

**(b)** Some scientists think that growing willow and using it as a biofuel doesn't contribute to climate change.

Explain fully why they make this claim.

_____

_____

_____

_____ [3]

**(c)** Suggest one way the Government could encourage farmers to grow willow.

_____ [1]

**THIS IS THE END OF THE QUESTION PAPER**



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General Certificate of Secondary Education
2010–2011

# Science: Single Award (Modular)

## Human Activity and Health
## Module 2
## Foundation Tier

**[GSC21]**

**THURSDAY 11 NOVEMBER 2010, AFTERNOON**

# MARK SCHEME



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| | | | | AVAILABLE MARKS |
|---|---|---|---|---|
| **1** | **(a)** | | | |

| Type of microbe | Disease |
|---|---|
| | gonorrhoea |
| virus | |
| | thrush |

[3]

**(b)** skin – blood clotting [2] 5

**2** **(a)** **(i)** 157 cm [1]

**(ii)** 1 [1]

**(iii)** gradual differences between individuals/no discrete groups/ wide range/gradual change [1]

**(b)** tongue rolling [1]

**(c)** **(i)** feel good factor/vitamin D/looks attractive/confidence [1]

**(ii)** disadvantage – burns/(skin) cancer/skin damage [1] 6

**3** **(a)** **(i)** better diets; better medical care [2]

**(ii)** pollution/using up resources/food [1]

**(b)** **(i)** A and C [1]
B [1] [2]

**(ii)** quotas/sanctuary/larger meshes/decommissioning/ number of fishing days allowed; appropriate explanation (must have attempted description to get explanation) [2] 7

**4** **(a)** **(i)** 3 legs correct = [2]; 2 legs correct = [1] [2]

**(ii)** north/north-west [1]

**(iii)** wind; sun/light; water/rain/humidity/moisture; temperature
Any **two** [2]

**(iv)** larger area of tree sampled; more trees; more compass points
Any **two** [2]

**(b)** decrease in number/fewer/**not** die/**not** won't grow/**not** none [1] 8

| | | | | AVAILABLE MARKS |
|---|---|---|---|---|
| **5** | **(a)** | contamination in broken flask or converse;<br>because microbes could gain entry;<br>swan neck traps microbes;<br>Any **three** | [3] | |
| | **(b)** | same soup; same time; same temperature; both sterilised<br>Any **two** | [2] | 5 |
| **6** | **(a)** | **(i)** reduction in number of children vaccinated | [1] | |
| | | **(ii)** more catching measles/numbers went up | [1] | |
| | | **(iii)** vaccine proved to be safe/link with autism not proven | [1] | |
| | **(b)** | **(i)** antibiotic not specific/combats range of bacteria;<br>antibiotic faster acting | [2] | |
| | | **(ii)** development of antibiotic **resistance**/"superbugs" | [1] | |
| | **(c)** | **(i)** bacteria inside white blood cell/phagocyte engulfing | [1] | |
| | | **(ii)** phagocytosis | [1] | 8 |
| **7** | **(a)** | fast growing/short life cycle; never runs out/renewable/regrows | [2] | |
| | **(b)** | link between climate change and global warming; carbon dioxide both produced and used; equal amounts | [3] | |
| | **(c)** | subsidy **or** implied | [1] | 6 |
| | | | **Total** | **45** |



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| Uimhir Lárionaid | |
|---|---|
| 71 | |

| Uimhir Iarrthóra | |
|---|---|
| | |

General Certificate of Secondary Education
2009–2010

# Eolaíocht: Teastas Singil (Modúlach)

## Gníomhaíocht agus Sláinte an Duine
## Modúl 2

## Bonnsraith

**[GSC21]**

GSC21

**DÉARDAOIN 20 BEALTAINE 2010, IARNÓIN**

**AM**

45 nóiméad.

**TREOIR D'IARRTHÓIRÍ**

Scríobh d'Uimhir Lárionaid agus d'Uimhir Iarrthóra sna spásanna chuige sin ag barr an leathanaigh seo.
Scríobh do fhreagraí sna spásanna chuige sin sa scrúdpháipéar seo.
Freagair **gach ceann** de na **seacht** gceist.

**EOLAS D'IARRTHÓIRÍ**

Is é 45 an marc iomlán don pháipéar seo.
Léiríonn figiúirí idir lúibíní ar thaobh na láimhe deise de leathanaigh na marcanna atá ag dul do gach ceist nó do gach cuid de cheist.

| Don Scrúdaitheoir amháin | |
|---|---|
| Uimhir Ceiste | Marcanna |
| 1 | |
| 2 | |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| Marc Iomlán | |



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**LEATHANACH BÁN**

| Scrúdaitheoir Amháin | |
|---|---|
| Marcanna | Athmharc |

**1** **(a)** **(i)** Is cineál de mhiocróib iad baictéir agus víris is cúis le galair.
Línte in úsáid agat, ceangail gach cineál de mhiocrób den ghalar a bhfuil sé ina chúis leis.
Ní úsáidfear galar amháin.

| **Cineál de mhiocrób** | **Galar** |
|---|---|
| | Truis |
| Baictéir | |
| | Salmonella (nimhiú bia) |
| Víreas | |
| | Fliú |

[2]

**(ii)** Ainmnigh an **cineál** eile de mhiocrób is féidir a bheith ina chúis le galair.

_____ [1]

**(b)** Comhlánaigh na habairtí seo a leanas.

Roghnaigh ó:

**víris : baictéir : peinicillin : paraicéiteamól**

Tugadh _____ ar an chéad antaibheathach a fionnadh.

Níl éifeacht ag antaibheathaigh ach ar _____ . [2]


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| Scrúdaitheoir Amháin | |
|---|---|
| Marcanna | Athmharc |

**2** **(a)** Nuair a thiteann an líon d'orgánach beo go dtí leibhéil iontach íseal, is féidir go mbeidh an speiceas i mbaol díothaithe.

**(i)** Cén focal a chuireann síos ar speiceas atá i mbaol díothaithe?

Roghnaigh ó:

**dódó** **i gcontúirt** **iomaíoch**

_____ [1]

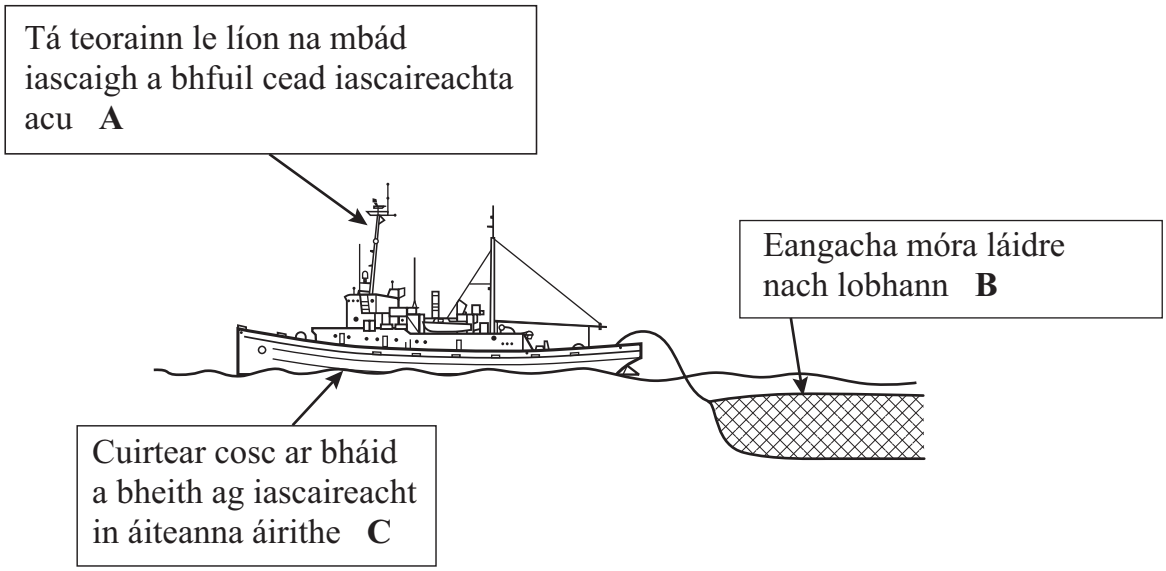
**(ii)** Tá a lán cineálacha iasc, amhail trosc, i mbaol díothaithe. Ainmnigh an speiceas is cúis, den chuid is mó, le líon na n-iasc a bheith ag laghdú.
**Ciorclaigh** do fhreagra.

**siorcanna**

**daoine**

**míolta móra** [1]

**(b)** Sa léaráid thíos taispeántar gnéithe áirithe den iascaireacht nua-aimseartha.




**(i)** Cén ghné (**A**, **B** nó **C**) sa léaraid **nach mbeidh** ina cuidiú le stoic iasc a chaomhnú?

_____ [1]



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**(ii)** Luaigh **dhá** rud is féidir a dhéanamh le stoic iasc a chaomhnú.

Roghnaigh ó:

**Radar níos fearr ar bháid nua-aimseartha**

**Eangacha a bhfuil mogaill mhóra iontu**

**Líon na laethanta iascaireachta a laghdú**

**Eangacha a bhfuil mogaill bheaga iontu**

1. _____

2. _____ [2]

| Scrúdaitheoir Amháin | |
|---|---|
| Marcanna | Athmharc |
| | |

**(c)** Tá ioraí rua i mbaol díothaithe in Éirinn.



*© Terry Whittaker/Alamy*

Luaigh rud **amháin** is féidir a dhéanamh lena líon a mhéadú.
**Ciorclaigh** do fhreagra.

**Truailliú a chosc in aibhneacha**

**Líon na n-ioraí glasa a laghdú**

**Plandaí róslabhrais a bhaint ar shiúl**

[1]

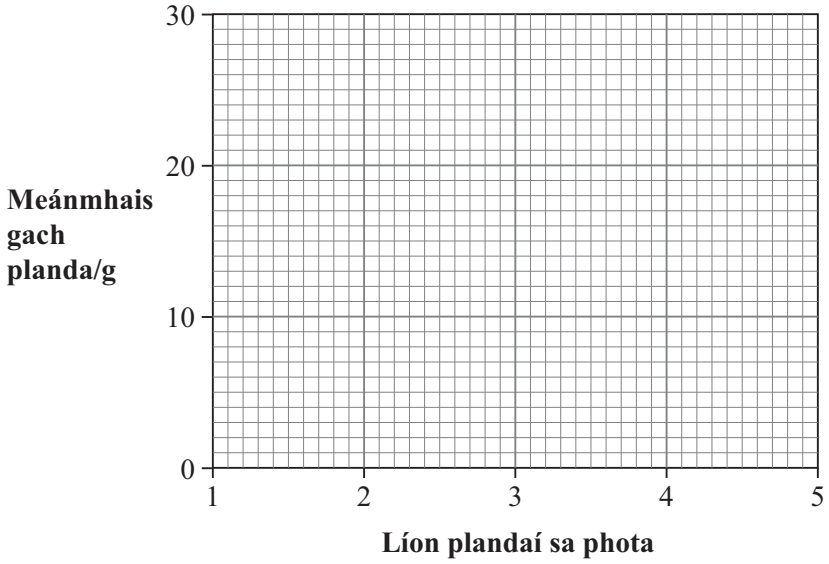
| Scrúdaitheoir Amháin | |
|---|---|
| Marcanna | Athmharc |

**3** Rinne Sinéad imscrúdú lena fháil amach an raibh éifeacht ag líon na bplandaí i bpota ar fhás gach planda.

Seo iad na torthaí a fuair sí.

| **Líon plandaí i bpota** | **Meánmhais gach planda/g** | **Líon na nduilleog** | **Líon na bhfréamhacha** |
|---|---|---|---|
| 1 | 27 | 5 | 4 |
| 2 | 18 | 5 | 4 |
| 3 | 12 | 4 | 4 |
| 4 | 9 | 3 | 4 |
| 5 | 7 | 2 | 4 |

**(a)** Ar an eangach thíos, breac **líneghraf** de mheánmhais gach planda ar líon na bplandaí sa phota.




[2]

**(b)** Na torthaí agus d'eolas féin in úsáid, comhlánaigh na habairtí seo a leanas.

De réir mar a mhéadaíonn líon na bplandaí sa phota,

_____ meánmhais gach planda. Tarlaíonn seo de

bhrí go bhfuil siad in iomaíocht lena chéile le haghaidh acmhainní

amhail cothaithigh, spás agus _____ .

Taispeánann na torthaí go bhfuil rud amháin ann **nach** dtéann an méadú ar líon na bplandaí i bpota i bhfeidhm air, is é sin líon na

_____ ar an phlanda. [3]



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| Scrúdaitheoir Amháin | |
|---|---|
| Marcanna | Athmharc |

**(c)** Luaigh **dhá** rud a dhéanfadh Sinéad san imscrúdú lena chinntiú go mbeadh a cuid torthaí bailí (triail chothrom).

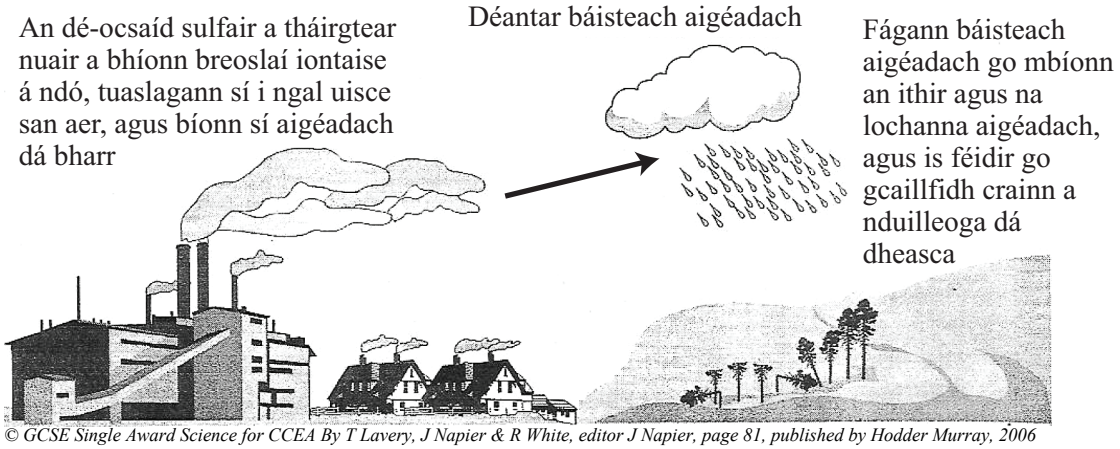
1. _____

2. _____ [2]

**(d)** Luaigh cad é a tharlódh dá gcuirfeadh Sinéad 20 planda sa phota.

_____ [1]

**4** **(a)** Taispeánann an léaráid seo a leanas an dóigh a dtarlaíonn báisteach aigéadach.




*© GCSE Single Award Science for CCEA By T Lavery, J Napier & R White, editor J Napier, page 81, published by Hodder Murray, 2006 ISBN 0340 926007 'Reproduced with permission'.*

**(i)** An léaráid agus do chuid eolais féin in úsáid agat, mínigh an fáth a dtéann an cineál truaillithe seo i bhfeidhm ar éisc.

_____ [1]

Le blianta beaga anuas laghdaíodh ar an truailliú a dhéanann báisteach aigéadach.

**(ii)** Luaigh dóigh **amháin** ar laghdaíodh ar mhéid na báistí aigéadaí.

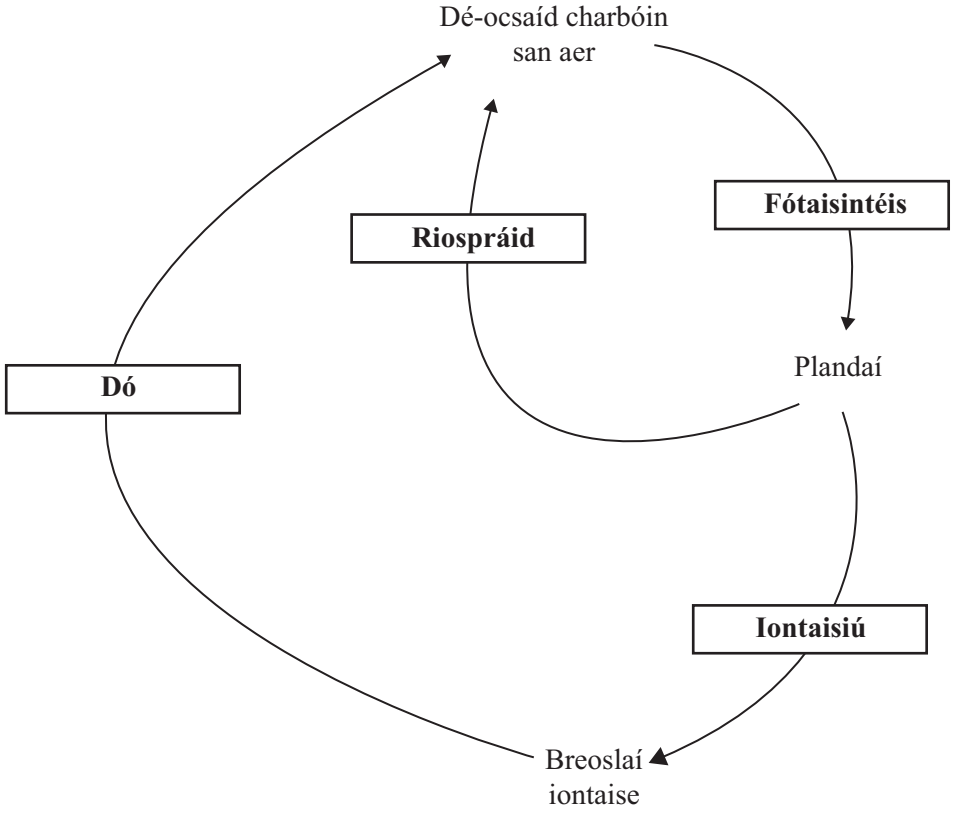
_____ [1]



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| Scrúdaitheoir Amháin | |
|---|---|
| Marcanna | Athmharc |

**(b)** Tá dé-ocsaíd charbóin ina cúis le truailliú aeir fosta. Taispeánann an léaráid seo a leanas cuid den timthriall carbóin. Taispeántar na próisis sna boscaí.




**(i)** Tháinig méadú iontach gasta ar na leibhéil dé-ocsaíd charbóin san atmaisféar le blianta beaga anuas. Ainmnigh an **próiseas** atá ina chúis leis seo.

_____ [1]

**(ii)** Síltear gurb é an méadú atá ag teacht ar na leibhéil dé-ocsaíd charbóin is cúis le téamh domhanda. Déan cur síos agus tabhair míniú ar dhóigh **amháin** a ndéanann téamh domhanda dochar d'orgánaigh bheo.

_____

_____

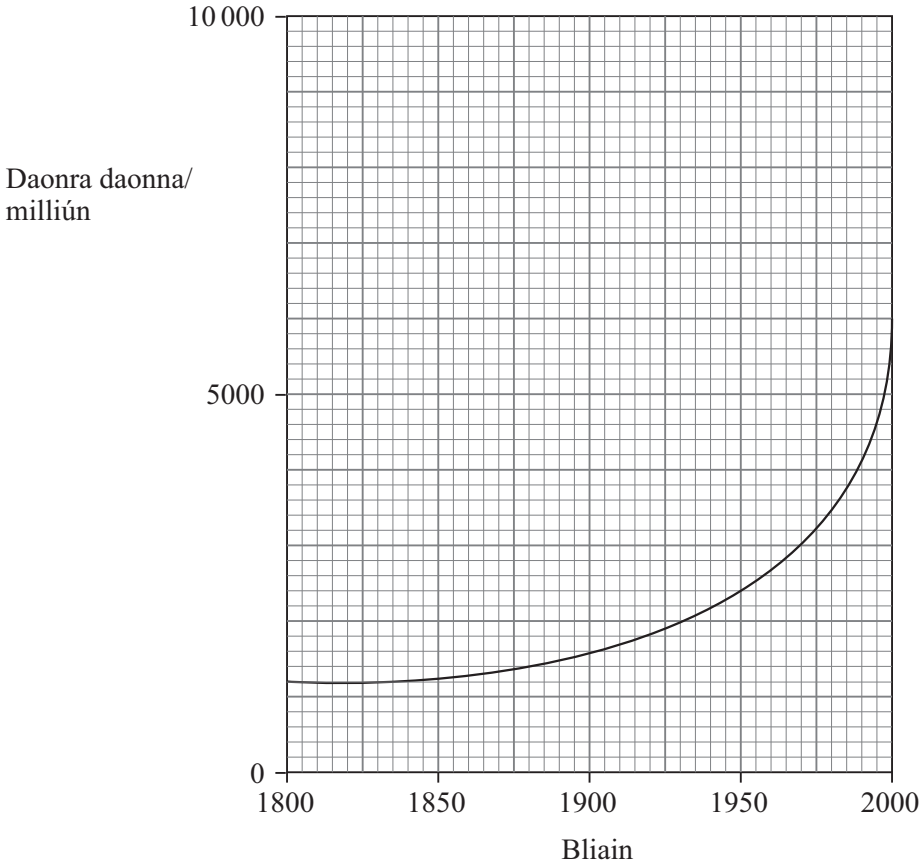
_____ [2]



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| Scrúdaitheoir Amháin | |
|---|---|
| Marcanna | Athmharc |

**(c)** Bíonn éifeacht fosta ag an daonra daonna a bheith ag fás ar an domhan thart orainn.
Sa ghraf thíos, taispeántar an méadú ar an daonra daonna le 200 bliain anuas.




**(i)** Comhlánaigh an abairt seo a leanas.

Roghnaigh ó:

**foisteanach** **ag ardú** **ag ísliú**

Tá an ráta faoina bhfuil an daonra daonna ag méadú _____ [1]

**(ii)** Tá an daonra daonna ag méadú cionn is go bhfuil daoine ag maireachtáil níos faide.
Luaigh **dhá** fháth a bhfuil daoine ag maireachtáil níos faide.

1. _____

2. _____ [2]


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**5** Is féidir go mothóidh daoine go maith nuair a bhíonn dath gréine orthu; ach, tá riosca níos mó ann go dtiocfaidh ailse craicinn orthu. Le blianta beaga anuas, tá ailse craicinn ar níos mó daoine cionn is go dtéann siad chuig stiúideo donnúcháin agus ar saoire ilchríochach níos minice.

| Scrúdaitheoir Amháin | |
|---|---|
| Marcanna | Athmharc |
| | |

**(a)** Ainmnigh an toisc thimpeallachta is cúis le hailse craicinn.

_____ [1]

**(b)** Beidh Máire ag dul chun na Spáinne ar feadh dhá sheachtain i Mí Iúil. Seachas gan dul amach faoin ghrian, luaigh **dhá** rud is féidir léi a dhéanamh agus í ar saoire le laghdú ar an riosca go dtiocfaidh ailse craicinn uirthi.

1. _____

2. _____ [2]

**(c)** Athruithe (sócháin) ar struchtúir i gcealla chraiceann an choirp is cúis le hailse.

Ainmnigh na struchtúir a bhíonn á n-athrú.

_____ [1]



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**6** Tá líon ciseal ag an chorp lena chosaint ar ghalar.

| Scrúdaitheoir Amháin | |
|---|---|
| Marcanna | Athmharc |
| | |

**(a)** Cosnaíonn codanna áirithe den chorp an corp ar mhiocróib. Comhlánaigh an tábla lena thaispeáint cén dóigh.

| **Cuid den chorp** | **An dóigh a gcosnaíonn sé ar mhiocróib** |
|---|---|
| Craiceann | |
| Seiciní múcasacha | |

[2]

**(b)** Cuir síos ar cad é is vacsaín ann, agus mínigh an dóigh a n-oibríonn sí.

_____

_____

_____

_____

_____ [3]

| Scrúdaitheoir Amháin | |
|---|---|
| Marcanna | Athmharc |
| | |

**7** **(a)** Déanann caitheamh tobac, ól alcóil agus mí-úsáid drugaí dochar do dhaoine agus don tsochaí. Sa tábla thíos, cuirtear na héifeachtaí a bhíonn ag na substaintí seo ar dhaoine i gcomparáid lena chéile.

**Eochair** An éifeacht is mó = 3
An éifeacht is lú = 1

| **Substaint** | **Is féidir go mbeidh sé ina chúis le fadhbanna meabhairshláinte** | **Is féidir go mbeidh sé ina chúis le timpistí bóthair** | **Is féidir go mbeidh sé ina chúis le hailse** |
|---|---|---|---|
| Tobac | 1 | 1 | 3 |
| Alcól | 3 | 3 | 2 |
| Cannabas | 2 | 2 | 1 |

**(i)** Tig le daoine fásta tobac agus alcól a úsáid go dleathach, ach is druga neamhdhleathach go fóill é cannabas. An t-eolas sa tábla in úsáid agat, mínigh an dóigh a gcuirfeadh lucht feachtais in iúl gur chóir go mbeadh cannabas dleathach.

_____

_____

_____ [2]

**(ii)** Níl sé dleathach do pháistí toitíní agus alcól a cheannach, ach tá sé dleathach do dhaoine fásta. Luaigh fáth le cad chuige.

_____ [1]

**(iii)** Ainmnigh an tsubstaint i ndeatach tobac a fhágann go bhfuil sé:

1. ina chúis le handúil _____ [1]

2. ina chúis le hailse _____ [1]



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| Scrúdaitheoir Amháin | |
|---|---|
| Marcanna | Athmharc |

**(b)** Taispeánann an tábla seo a leanas an patrún ólacháin a bhí ag triúr déagóirí thar thréimhse seacht lá. Taispeánann na luachanna an líon d'aonaid alcóil a d'ól siad.

| | Luan | Máirt | Céad | Déard | Aoine | Sath | Domh | **Iomlán** |
|---|---|---|---|---|---|---|---|---|
| Seán | 1 | 2 | 3 | 2 | 2 | 2 | 0 | |
| Antaine | 0 | 0 | 2 | 0 | 0 | 8 | 0 | |
| Pól | 0 | 0 | 0 | 0 | 2 | 2 | 0 | |

**(i)** Comhlánaigh an tábla le líon iomlán na n-aonad a d'ól gach déagóir i rith na seachtaine a thaispeáint. [1]

**(ii)** Ainmnigh an déagóir a bhí ar ragús óil.

_____ [1]

**(iii)** Molann an Rialtas nach rachadh daoine ar ragús óil. Luaigh **dhá** fháth le cad chuige.

_____

_____

_____ [2]

## SEO DEIREADH AN SCRÚDPHÁIPÉIR



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Cuireadh isteach ar chead chun an t-ábhar cóipchirt uile a atáirgeadh.
I gcásanna áirithe is féidir nár éirigh le CCEA teagmháil a dhéanamh le húinéirí cóipchirt agus beidh
sé sásta na hadmhálacha sin a fágadh ar lár a chur ina gceart amach anseo ach é a chur ar an eolas.

# GCSE

## Science: Single Award (Modular)

## End of Module Tests

## May 2010

# Mark Schemes

Issued: October 2010

Rewarding Learning

General Certificate of Secondary Education
2009 – 2010

# Science: Single Award (Modular)

Human Activity and Health
Module 2
Foundation Tier

**[GSC21]**

**THURSDAY 20 MAY 2010, AFTERNOON**

# MARK SCHEME



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| | | | | | AVAILABLE MARKS |
|---|---|---|---|---|---|
| **1** | **(a)** | **(i)** | Bacteria – salmonella; Virus – Flu | [2] | |
| | | **(ii)** | Fungi | [1] | |
| | **(b)** | | Penicillin – bacteria | [2] | 5 |
| **2** | **(a)** | **(i)** | Endangered | [1] | |
| | | **(ii)** | Humans | [1] | |
| | **(b)** | **(i)** | B | [1] | |
| | | **(ii)** | Nets with larger mesh sizes; limiting the number of days fishing can take place | [2] | |
| | **(c)** | | Reduce the number of grey squirrels | [1] | 6 |
| **3** | **(a)** | | All points correct [2]; 3-4 correct [1] | [2] | |
| | **(b)** | | decreases – water/light – roots | [3] | |
| | **(c)** | | Any **two** from:<br>Plants left for same length of time; same type of plant;<br>named condition; same size pots;<br>same nutrients / same compost/amount of compost;<br>given same amount of water | [2] | |
| | **(d)** | | Plants not grow / die | [1] | 8 |



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| | | | | | AVAILABLE MARKS |
|---|---|---|---|---|---|
| **4** | **(a)** | **(i)** | lakes become acidic / fish live in lakes / fish cannot escape / fish food affected | [1] | |
| | | **(ii)** | filters / alternative fuels / burn less fossil fuel / hybrid cars / catalytic converters | [1] | |
| | **(b)** | **(i)** | Combustion / burning | [1] | |
| | | **(ii)** | one mark for cause (e.g. ice caps melting, water levels rise) and one mark for effect (e.g. no habitat / animals drown – cause needed before second mark) (**not** kill) | [2] | |
| | **(c)** | **(i)** | The rate of increase is rising | [1] | |
| | | **(ii)** | Any **two** from: Better nutrition / better medicines / better sanitation | [2] | 8 |
| **5** | **(a)** | | UV (**not** sunlight) | [1] | |
| | **(b)** | | Any **two** from: Avoid hottest part of day / cover up / use sunscreen | [2] | |
| | **(c)** | | chromosomes / genes / alleles | [1] | 4 |
| **6** | **(a)** | | Prevents entry of microbes / barrier;<br>Catch/traps microbes that have gained entry | [2] | |
| | **(b)** | | Any **three** from: Dead / modified microbes injected:<br>causes lymphocytes / white blood cells; to produce antibodies;<br>antibodies latch on to microbes / complementary shape; immobilised;<br>creation of memory cells | [3] | 5 |
| **7** | **(a)** | **(i)** | Cannabis does less harm than alcohol/ no more than smoking;<br>any comparative value(s) from table | [2] | |
| | | **(ii)** | Adults better able to make decisions concerning lifestyle / risks / duty of care / children still developing | [1] | |
| | | **(iii)** | nicotine – tar | [2] | |
| | **(b)** | **(i)** | 12 – 10 – 4 | [1] | |
| | | **(ii)** | Tony | [1] | |
| | | **(iii)** | Greater harm to health specified; harm to society specified | [2] | 9 |
| | | | | **Total** | **45** |



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Rewarding Learning

| Centre Number | |
|---|---|
| 71 | |

| Candidate Number |
|---|
| |

General Certificate of Secondary Education
2009–2010

# Science: Single Award (Modular)

## Human Activity and Health
## Module 2

## Foundation Tier

**[GSC21]**

GSC21

**THURSDAY 25 FEBRUARY 2010, MORNING**

**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 seven** 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 | |
| 7 | |
| Total Marks | |



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| Examiner Only | |
|---|---|
| Marks | Remark |

**1** **(a)** Alcohol can cause harm if too much is taken.
Circle **two** things that can be done to **reduce** the harm caused by alcohol.

**Drink high-alcohol drinks such as vodka and whisky**

**Do not drink more than the recommended number of units**

**Only binge drink at weekends**

**Never drink and drive**

[2]

**(b)** Drugs can also cause harm. Using lines, link each type of drug to its main effect.
One effect will not be used.

| Drug | Effect |
|---|---|
| | Gives users a 'high' |
| Cannabis | |
| | Can cause lung cancer |
| Cocaine | |
| | Makes users feel relaxed or 'chilled out' |

[2]

**(c)** Complete the following sentences.

Choose from:

**carbon monoxide : oxygen : addictive : tar : harmless**

Smoking can also cause harm. The harmful substances

in cigarette smoke include _____ and

_____. Nicotine is also present, it increases heart rate

and is _____. [3]



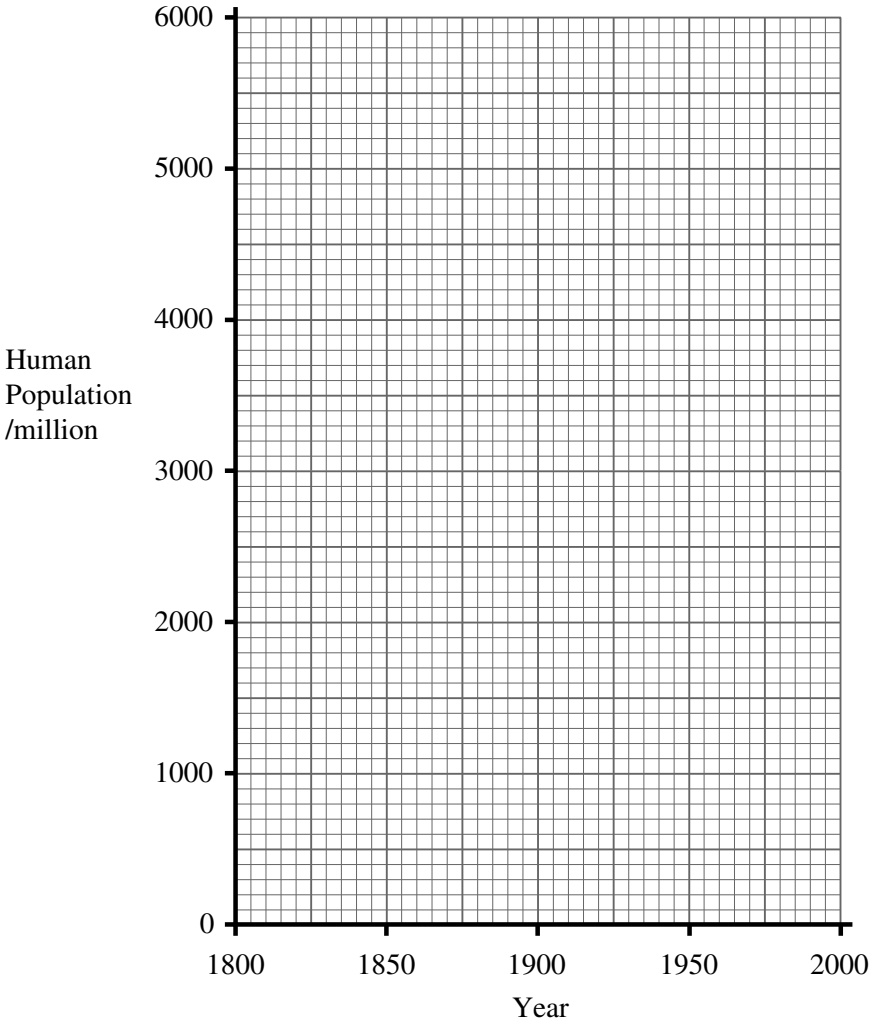
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| Examiner Only | |
|---|---|
| Marks | Remark |

**2** **(a)** The following table shows human population growth over 200 years.

| Year | Human population/ million |
|---|---|
| 1800 | 1000 |
| 1850 | 1500 |
| 1900 | 2000 |
| 1950 | 3000 |
| 2000 | 6000 |

**(i)** Use this information to draw a **line graph** on the grid below.




[2]

**(ii)** Calculate by how much the human population increased between the years 1800 and 2000.

_____ million [1]



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**(b)** One effect of the increase in human population is that there is more pollution. Complete the table below.

Choose from:

**water : acid rain : nitrogen : land**

| type of pollution | example |
|---|---|
| air | |
| | household refuse |
| | oil spillages |

[3]

Examiner Only

| Marks | Remark |
|---|---|
| | |



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| Examiner Only | |
|---|---|
| Marks | Remark |
| | |

**3** **(a)** There are four types of human blood groups. A survey of 10 people in Belfast produced the following results.

| Blood group | Number of people |
|---|---|
| A | 2 |
| B | 3 |
| AB | 4 |
| O | 1 |

**(i)** Name the type of variation shown by human blood groups.

Choose from:

**continuous** **discontinuous** **cloning**

_____ [1]

**(ii)** Give two reasons why you should **not** use the information from this survey to conclude that blood group AB is the most common group in Northern Ireland.

1. _____

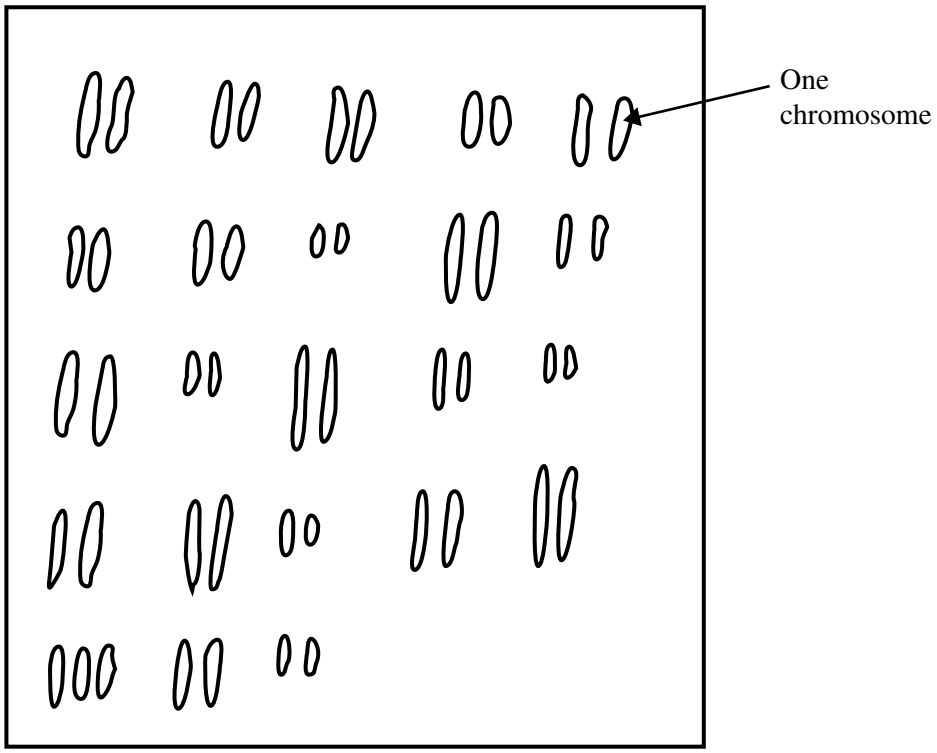
2. _____ [2]



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| Examiner Only | |
|---|---|
| Marks | Remark |
| | |

**(b)** Genetic mutations can also cause variation. Shown below are the chromosomes in John's cells.




**(i)** Normally human cells have 46 chromosomes. How many chromosomes are in John's cells?

_____ [1]

**(ii)** Name the condition that John is suffering from.

Choose from:

**cancer : Down's syndrome : cystic fibrosis**

_____ [1]



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| Examiner Only | |
|---|---|
| Marks | Remark |
| | |

**(c)** Skin cancer is caused by mutations in skin cells.

**(i)** State what is meant by the term cancer.

Choose from:

**controlled cell division : uncontrolled cell division : uncontrolled microbe growth**

_____ [1]

**(ii)** Name the environmental factor that causes skin cancer.

Choose from:

**radio waves : microwaves : UV light**

_____ [1]



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**(Questions continue overleaf)**


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| Examiner Only | |
|---|---|
| Marks | Remark |

**4** **(a)** Grey squirrels, since they were introduced by man, have spread rapidly across Ireland.

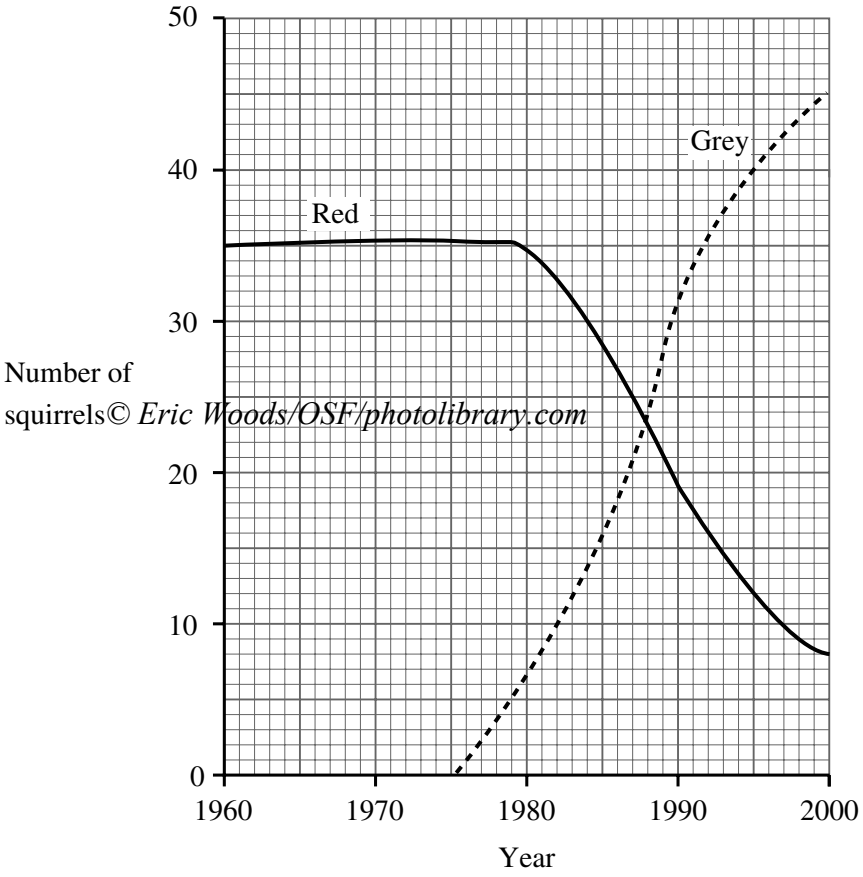


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The following graph shows the number of squirrels in a Co. Antrim wood over a forty year period.




**(i)** It is suggested that the spread of grey squirrels is responsible for the fall in red squirrel numbers. Give **one** piece of evidence from the graph that supports this.

_____ [1]



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**(ii)** What will eventually happen to the red squirrels if their numbers continue to decrease?

_____ [1]

**(iii)** Suggest **one** way of stopping the spread of grey squirrels.

_____ [1]

**(b)** **(i)** The grey squirrel is an example of a competitive invasive species. From the information given and your knowledge state two characteristics of competitive invasive species.

1. _____

2. _____ [2]

**(ii)** Name **one** other competitive invasive species.

_____ [1]

Examiner Only

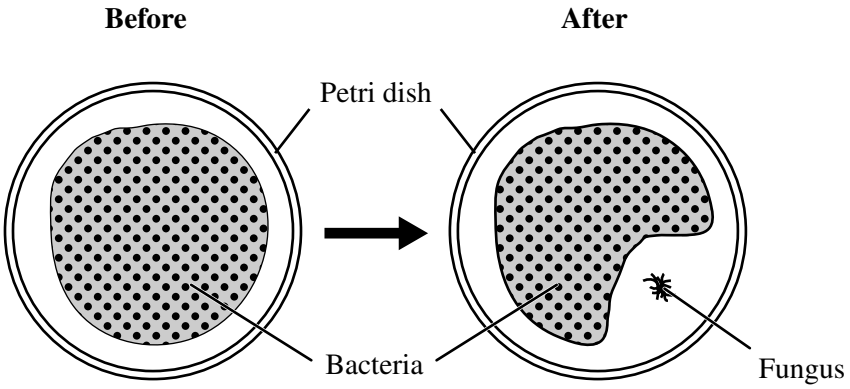
| Marks | Remark |
|---|---|
| | |



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| Examiner Only | |
|---|---|
| Marks | Remark |
| | |

**5** **(a)** The following diagram shows what happened when bacteria grown in a Petri dish by Alexander Fleming was contaminated by a fungus.




**(i)** What effect did the fungus have on the bacteria?

_____ [1]

**(ii)** Name the antibiotic that was eventually produced following this observation.

_____ [1]

**(iii)** Name **one** disease that can be cured by antibiotics.

_____ [1]

**(b)** Complete the following sentence.

The spread of 'superbugs' can be reduced by having good _____ in hospitals and avoiding the over-use of antibiotics which prevents bacteria becoming _____ to them. [2]



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**6** Willow can be grown as a biofuel. It is very fast growing and can be harvested every three years. When growing, willow removes carbon dioxide from the air but when burnt, releases it back into the air and is described as being carbon neutral.

Use this information and your knowledge to answer the questions below.

**(a)** Describe and explain why using willow as a biofuel is an example of sustainable development.

_____

_____

_____ [2]

**(b)** Suggest what is meant by the term **carbon neutral**.

_____

_____ [2]

**(c)** Suggest **one** advantage of using carbon neutral fuel sources.

_____ [1]

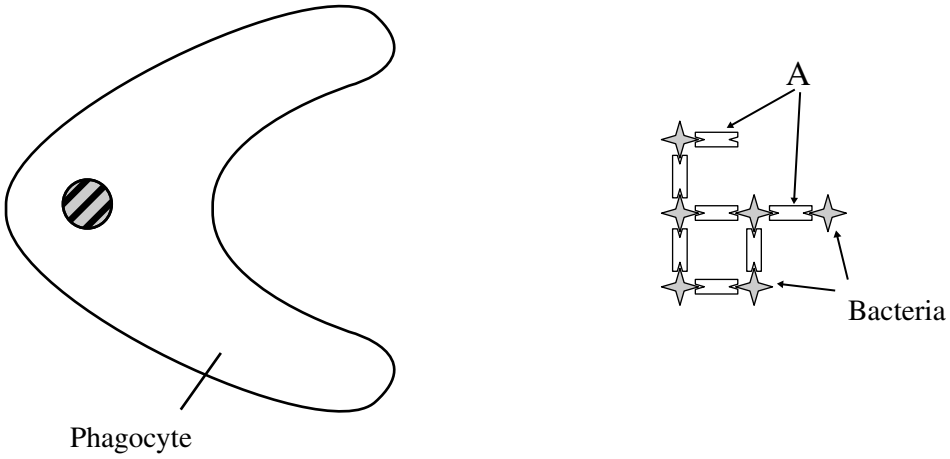
| Examiner Only | |
|---|---|
| Marks | Remark |
| | |



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| Examiner Only | |
|---|---|
| Marks | Remark |
| | |

**7** **(a)** The following diagram shows a phagocyte about to engulf (destroy) a clump of bacteria.




**(i)** Name the process described above.

_____ [1]

**(ii)** Name the structures labelled A on the diagram.

_____ [1]

**(iii)** Use the diagram and your knowledge to describe how the body's defences caused the bacteria to form in a clump.

_____

_____

_____

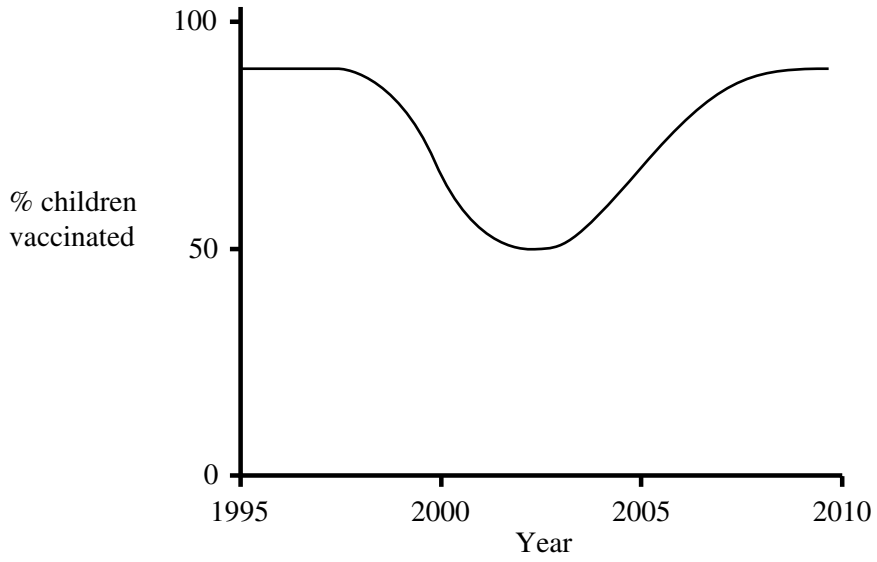
_____ [3]



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| Examiner Only | |
|---|---|
| Marks | Remark |

**(b)** The following graph shows how the percentage of children being vaccinated against MMR has changed over the last 15 years.




**(i)** Describe how the percentage of children being vaccinated against MMR has changed over the last 15 years. Explain why these changes took place.

_____

_____

_____

_____ [3]

**(ii)** Suggest **one** reason why it is unlikely that there will ever be 100% uptake with any vaccination programme.

_____ [1]

## THIS IS THE END OF THE QUESTION PAPER



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# GCSE

## Science: Single Award (Modular)

## March 2010

# Mark Schemes

Issued: May 2010

Rewarding Learning

**General Certificate of Secondary Education**
**February 2010**

# Science: Single Award (Modular)

## Human Activity and Health
## Module 2

## Foundation Tier

**[GSC21]**

**THURSDAY 25 FEBRUARY 2010, MORNING**

# MARK SCHEME


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| | | | | AVAILABLE MARKS |
|---|---|---|---|---|
| **1** | **(a)** | do not drink more than the recommended amount (units); never drink and drive | [2] | |
| | **(b)** | Cannabis – makes users feel relaxed or 'chilled out'<br>Cocaine – gives users a 'high' | [2] | |
| | **(c)** | tar; carbon monoxide; addictive | [3] | 7 |
| **2** | **(a)** | **(i)** all points correct 2; 3-4 points correct 1 | [2] | |
| | | **(ii)** 5000 million | [1] | |
| | **(b)** | <table><tr><td></td><td></td></tr><tr><td></td><td>acid rain</td></tr><tr><td>land</td><td></td></tr><tr><td>water</td><td></td></tr></table> | [3] | 6 |
| **3** | **(a)** | **(i)** discontinuous | [1] | |
| | | **(ii)** only Belfast; small sample size | [2] | |
| | **(b)** | **(i)** 47 | [1] | |
| | | **(ii)** Down's syndrome | [1] | |
| | **(c)** | **(i)** uncontrolled cell division | [1] | |
| | | **(ii)** UV light | [1] | 7 |
| **4** | **(a)** | **(i)** red numbers only start to fall after grey squirrels arrive / as grey squirrels number rise red numbers fall | [1] | |
| | | **(ii)** become endangered / extinct | [1] | |
| | | **(iii)** culling / hunting / erect barriers / introduce predator of grey squirrels | [1] | |
| | **(b)** | **(i)** high reproductive rate / spread rapidly; at expense of other species; difficult to control; introduced by man (any two) | [2] | |
| | | **(ii)** rhododendron / zebra mussel | [1] | 6 |


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| | | | | | AVAILABLE MARKS |
|---|---|---|---|---|---|
| **5** | **(a)** | **(i)** | kills it / stops growth / destroys | [1] | |
| | | **(ii)** | penicillin | [1] | |
| | | **(iii)** | gonorrhoea / salmonella / tuberculosis / MRSA / STI / bronchitis / or any bacterial disease | [1] | |
| | **(b)** | | hygiene; resistant | [2] | 5 |
| **6** | **(a)** | | will not run out; fast growth / short life cycle | [2] | |
| | **(b)** | | carbon dioxide both produced and used; amount used = amount produced | [2] | |
| | **(c)** | | carbon dioxide in atmosphere doesn't increase / doesn't affect global warming | [1] | 5 |
| **7** | **(a)** | **(i)** | phagocytosis | [1] | |
| | | **(ii)** | antibodies | [1] | |
| | | **(iii)** | white blood cells / lymphocytes; produce antibodies; antibodies join with antigen / microbe; reference to complementary shape (any three) | [3] | |
| | **(b)** | **(i)** | fall around 1998 then rise back to original level; scare about autism / side effects; further research shows that MMR vaccination is safe | [3] | |
| | | **(ii)** | worry about side effects / personal choice / logistic issues / already had disease | [1] | 9 |
| | | | | **Total** | **45** |



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