

GCSE COMBINED SCIENCE: TRILOGY

F

Foundation Tier Paper 1: Biology 1F

Specimen 2018

Time allowed: 1 hour 15 minutes

Materials

For this paper you must have:

- a ruler
- a calculator.

Instructions

- Answer **all** questions in the spaces provided.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- There are 70 marks available on this paper.
- The marks for questions are shown in brackets.
- You are expected to use a calculator where appropriate.
- You are reminded of the need for good English and clear presentation in your answers.

Advice

In all calculations, show clearly how you work out your answer.

Please write clearly, in block capitals, to allow character computer recognition.

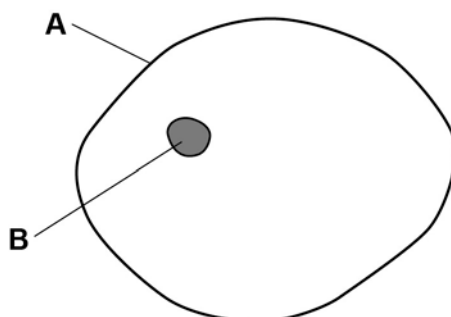
Centre number

Candidate number

Surname

Forename(s)

Candidate signature

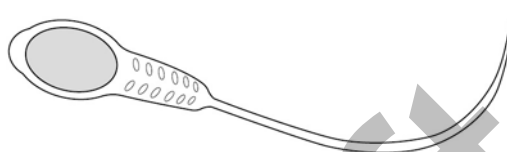
0 1**Figure 1** shows an animal cell.**Figure 1****0 1****. 1**What is structure **A**?**[1 mark]**Tick **one** box.Cell membrane ☐Cell wall ☐Chromosome ☐Cytoplasm ☐**0 1****. 2**What is structure **B**?**[1 mark]**Tick **one** box.Chloroplast ☐Mitochondria ☐Nucleus ☐Vacuole ☐

0 1 . 3 Name **one** structure in a plant cell that is **not** found in an animal cell.

[1 mark]

0 1 . 4 **Figure 2** shows a sperm cell.

Figure 2



Describe how a sperm cell is adapted to carry out its function.

[1 mark]

0 1 . 5 What is the name for a group of cells with a similar structure and function?

[1 mark]

Tick **one** box.

An organ ☐

An organism ☐

A system ☐

A tissue ☐

Question 1 continues on the next page

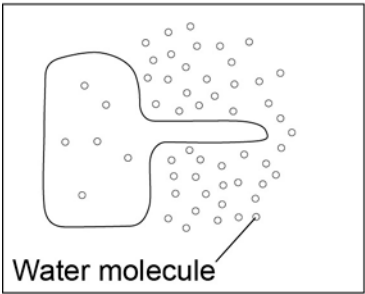
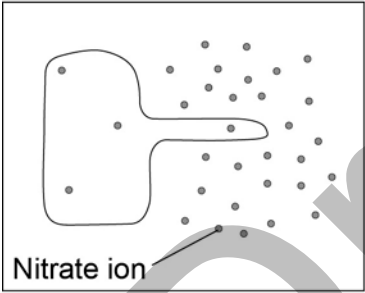
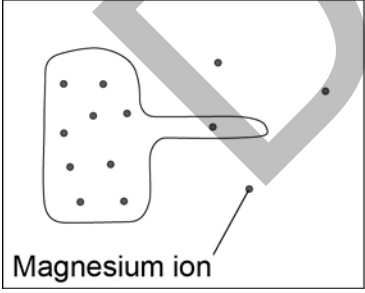
0 1 . 6 Substances can move into and out of cells by three processes.

The diagrams show the concentration of different substances inside and outside a root hair cell.

How would each substance move into the root hair cell?

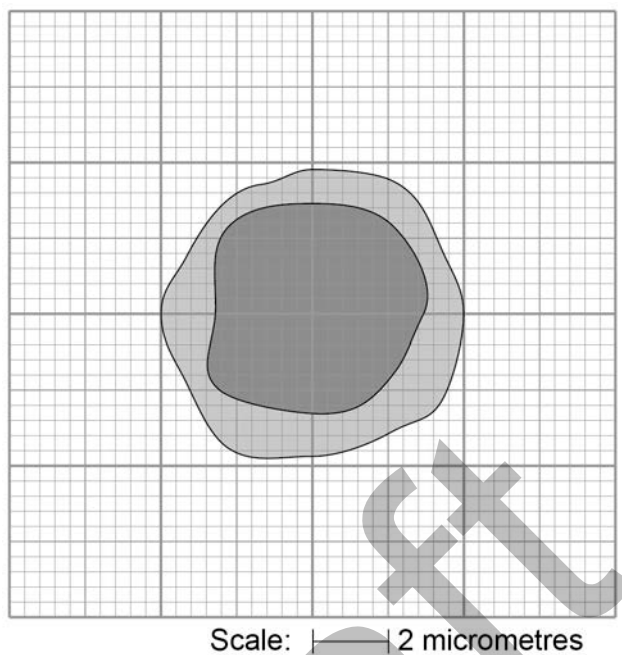
[2 marks]

Draw **one** line from each root hair cell to the correct process.

Root hair cell	Process
 Water molecule	☐ Active transport
 Nitrate ion	☐ Diffusion
 Magnesium ion	☐ Osmosis

Turn over for the next question

Draft

0 2**Figure 3** shows a scale drawing of one type of cell in blood.**Figure 3****0 2 . 1**

Use the scale to determine the width of the cell.

Give your answer to the nearest micrometre.

[1 mark]

Width of cell = _____ micrometres

0 2 . 2 Complete **Table 1**.

[3 marks]

Table 1

Part of the blood	Function
	Carries oxygen around the body
	Protects the body against infection
Plasma	

0 2 . 3 Platelets are fragments of cells.

Platelets help the blood to clot.

Suggest what might happen if the blood did **not** clot.

[1 mark]

Turn over for the next question

0 3

Respiration can happen aerobically or anaerobically.

Respiration transfers energy from glucose.

0 3

. 1

Draw **one** line from each type of respiration to the correct information.

[2 marks]

Type of respiration

Information

Aerobic respiration

Anaerobic respiration

Produces ethanol

Uses oxygen

Uses carbon dioxide

Produces lactic acid

0 3

. 2

Table 2 shows the amount of energy released by aerobic and anaerobic respiration.

Table 2

	Energy in kJ transferred from 1 g of glucose
Aerobic respiration	16.1
Anaerobic respiration	1.2

Suggest why human cells might respire anaerobically, even though only a small amount of energy is transferred.

[1 mark]

0 3 . 3 Yeast is used in the brewing and baking industries.

Suggest why yeast is used in these industries.

[3 marks]

Turn over for the next question

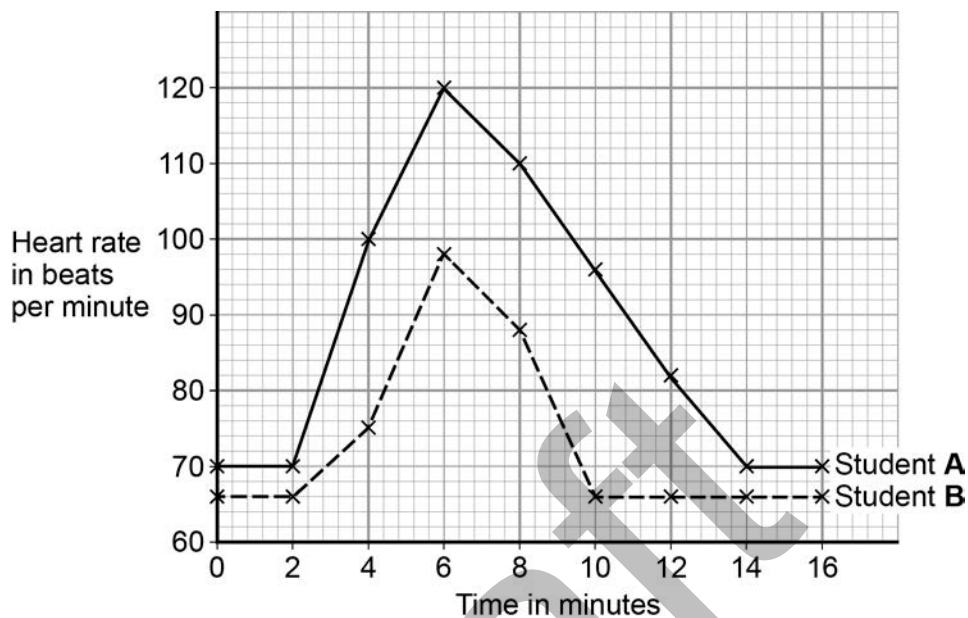
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0 4

Some students investigated how exercise affects heart rate.

Figure 4 shows their results.

Figure 4

**0 4 . 1**

What was Student A's resting heart rate?

[1 mark]

Resting heart rate = _____ beats per minute

0 4 . 2

The students started running at 2 minutes.

What evidence for this is in **Figure 4**?

[1 mark]

0 4 . 3 For how many minutes did the students run?

[1 mark]

Tick **one** box.

2 ☐

4 ☐

6 ☐

14 ☐

0 4 . 4 Student **B** is fitter than Student **A**.

Use **Figure 4** to give **two** pieces of evidence that support this statement.

[2 marks]

1 _____

2 _____

0 4 . 5 There are changes in heart rate and also in breathing during exercise.

Describe the changes in breathing during exercise.

Explain why these changes occur.

[4 marks]

There are no questions printed on this page

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0 5

When an organism grows, new cells are produced by cell division.

0 5 . 1

What type of cell division happens to produce new body cells?

[1 mark]

Tick **one** box.

Differentiation ☐

Meiosis ☐

Mitosis ☐

0 5 . 2

Why can cancers grow very large?

[1 mark]

Tick **one** box.

Cancer cells are specialised ☐

Cell division is slow ☐

Cell division is uncontrolled ☐

0 5 . 3

Give **one** factor which increases the risk of getting cancer.

[1 mark]

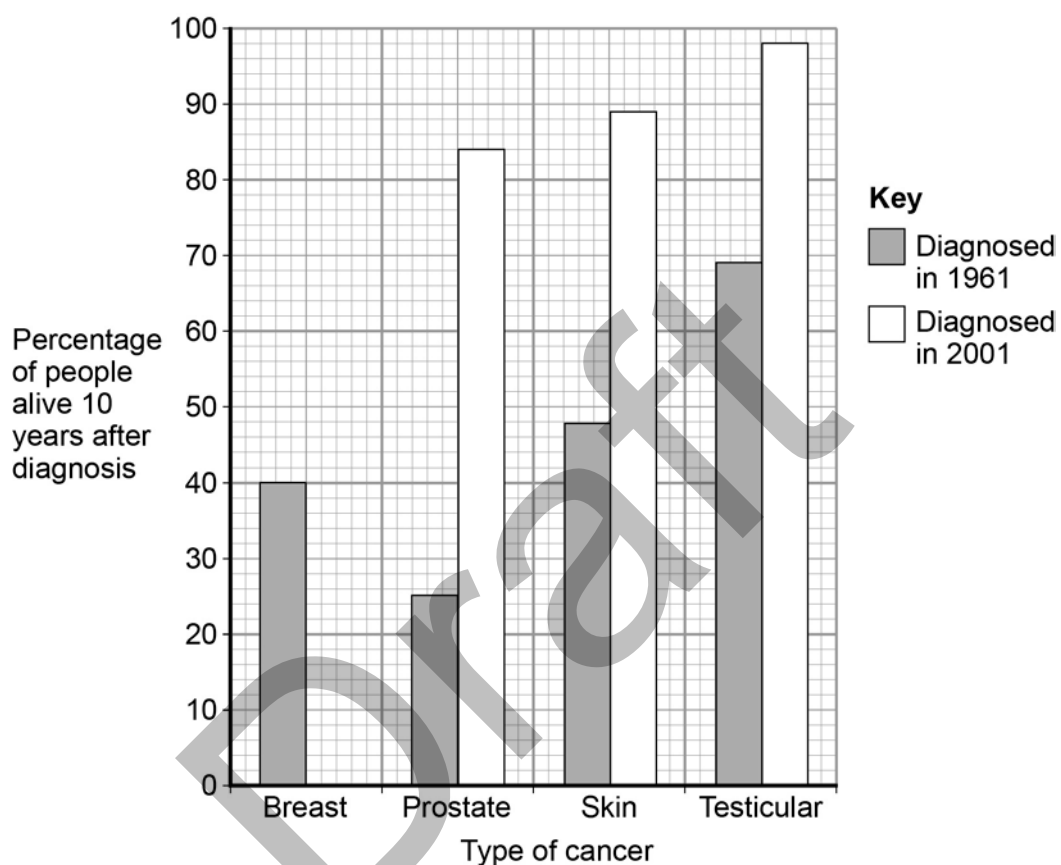
Question 5 continues on the next page

Survival rates for people with cancer have improved a lot.

People who are alive 10 years after diagnosis are usually considered to be cured.

Look at **Figure 5** shows data for people diagnosed with cancer in 1961 and 2001.

Figure 5



0 5 . 4 78% of people diagnosed with breast cancer in 2001 were alive 10 years later.

Complete **Figure 5** to show this information.

[1 mark]

0 5 . 5 Which type of cancer diagnosed in 1961 had the highest survival rate?

[1 mark]

Tick **one** box.

Breast ☐

Prostate ☐

Skin ☐

Testicular ☐

0 5 . 6 Which type of cancer shows the biggest improvement in the percentage of people alive after 10 years?

[1 mark]

Tick **one** box.

Breast ☐

Prostate ☐

Skin ☐

Testicular ☐

0 5 . 7 Suggest **two** reasons why the survival rates for all cancers have increased.

[2 marks]

1 _____

2 _____

Turn over for the next question

0 6

Pathogens cause infectious diseases in animals and plants.

0 6**. 1**Draw **one** line from each disease to the type of pathogen that causes the disease.**[3 marks]****Disease****Type of pathogen**

Gonorrhoea

Bacterium

Malaria

Fungus

Measles

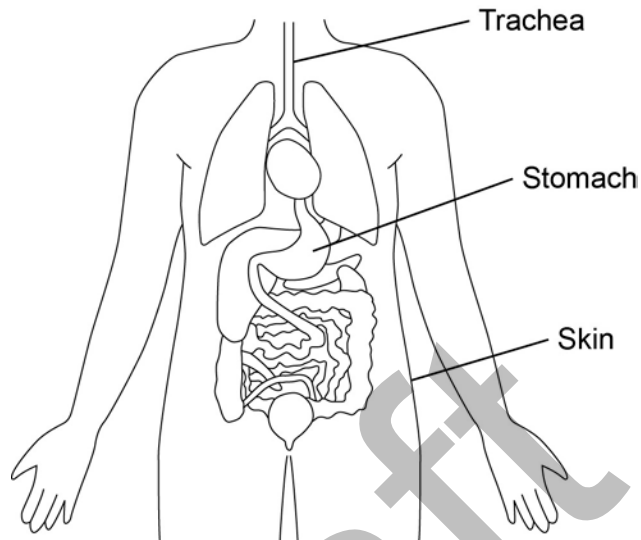
Protist

Virus

Some parts of the human body have adaptations to reduce the entry of live pathogens.

Look at **Figure 6**.

Figure 6



0 6 . 2

Suggest how the human body is adapted to reduce the entry of live pathogens.

Use information from **Figure 6**.

[4 marks]

Question 6 continues on the next page

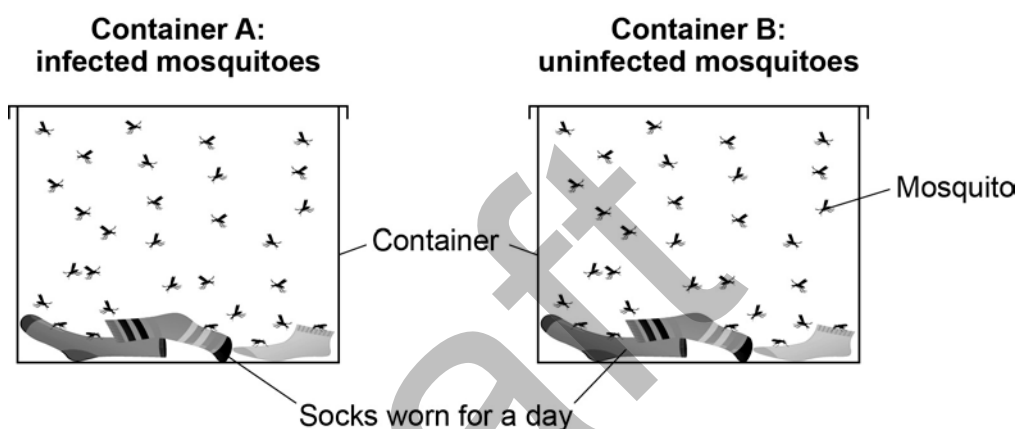
Malaria is a serious disease that can be fatal.

Malaria is spread to humans by infected mosquitoes.

Scientists investigated the behaviour of mosquitoes to understand how the spread of malaria could be controlled.

Figure 7 shows the equipment the scientists used.

Figure 7



This is the method used.

1. 30 mosquitoes **infected with malaria** were placed in Container **A**.
2. 30 **uninfected** mosquitoes were placed in Container **B**.
3. The total number of times the mosquitoes landed on the socks was recorded.

0 6 . 3 Name the dependent variable and **one** control variable in this investigation. **[2 marks]**

Dependent variable _____

Control variable _____

0 6 . 4 Infected mosquitoes landed on the socks three times more often than uninfected mosquitoes.

Explain how this information can be used to reduce the spread of malaria. **[2 marks]**

Question 6 continues on the next page

0 6 . 5 Tobacco mosaic virus (TMV) affects many species of plant.

Figure 8 shows a leaf infected with TMV.

Figure 8



Yellow patches where
TMV has destroyed
chloroplasts

TMV destroys chloroplasts in the leaf.

Explain how this could affect the growth of the plant.

[3 marks]

Turn over for the next question

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0 7

A scientist investigated the rate of starch digestion.

He put starch solution into a test tube and added an enzyme.

0 7**. 1**

Name **one** enzyme that digests starch.

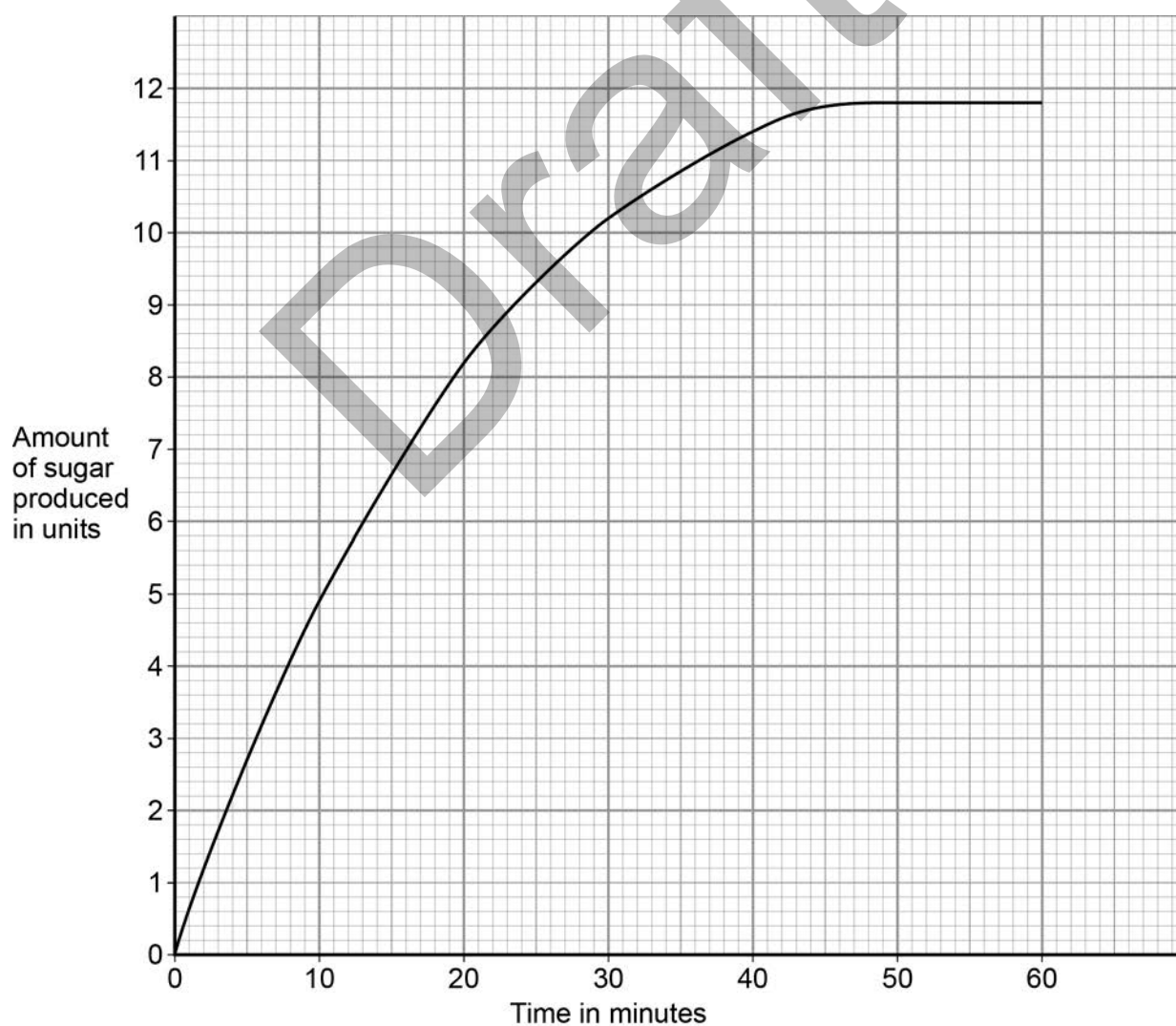
[1 mark]

The scientist:

- put the test tube into a water bath at 25 °C
- measured the amount of sugar produced every minute.

His results are shown in **Figure 9**.

Figure 9



0 7 . 2 After how many minutes did the reaction stop?

[1 mark]

_____ minutes

0 7 . 3 Why did the reaction stop?

[1 mark]

Tick **one** box.

All the enzyme was used up ☐

All the starch was used up ☐

All the sugar was used up ☐

60 minutes was not enough time ☐

0 7 . 4 Calculate the mean rate of sugar produced per minute during the first 10 minutes.

[2 marks]

Mean rate = _____ units per minute

0 7 . 5 The scientist repeated the investigation at 37 °C.

Draw a line on **Figure 9** to show the results he would get.

[2 marks]

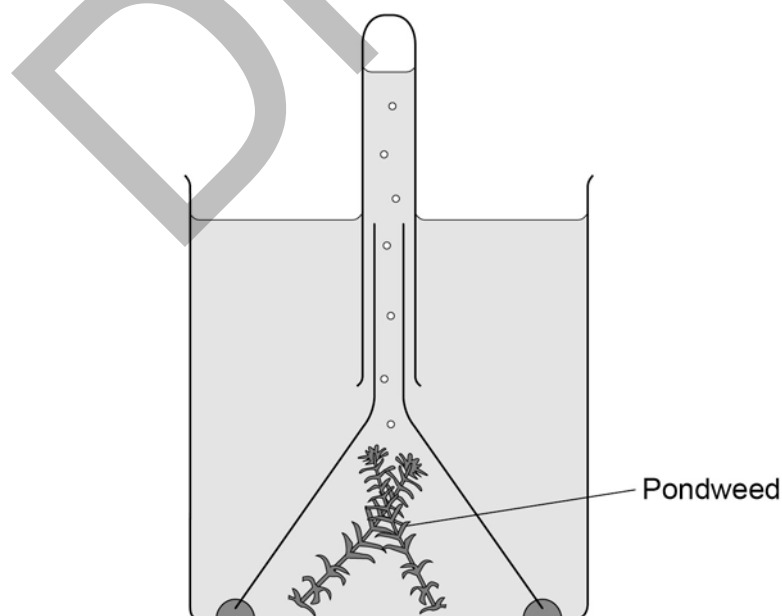
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0 8

Plants photosynthesise to make food.

0 8**. 1**

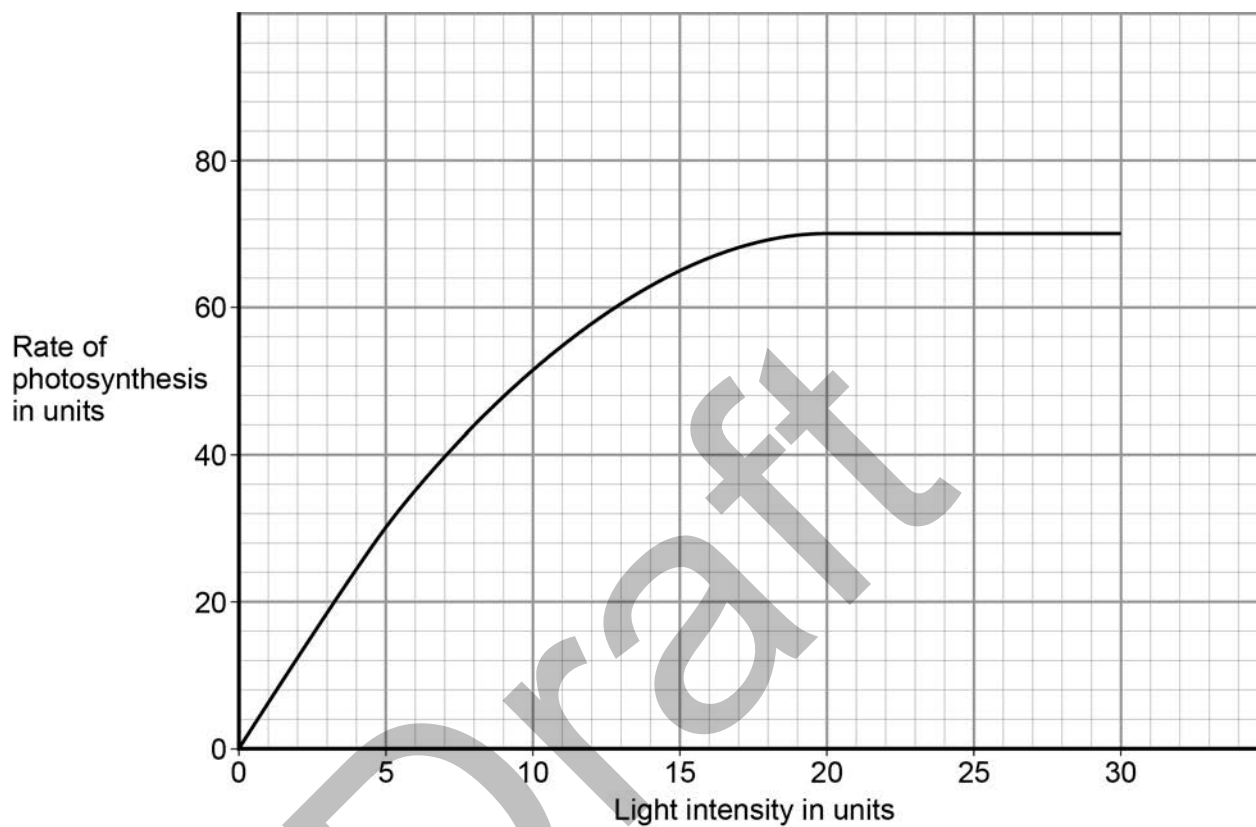
What is the word equation for photosynthesis?

[1 mark]Tick **one** box.carbon dioxide + glucose $\longrightarrow$ oxygen + water☐glucose + oxygen $\longrightarrow$ carbon dioxide + water☐oxygen + water $\longrightarrow$ carbon dioxide + glucose☐water + carbon dioxide $\longrightarrow$ oxygen + glucose☐**0 8****. 2****Figure 10** shows some of the apparatus that can be used to measure the rate of photosynthesis.**Figure 10**

A scientist carried out a similar investigation.

Her results are shown in **Figure 11**.

Figure 11



0 8 . 3 The scientist said:

‘Light is not a limiting factor at a light intensity of 25 units.’

Give evidence from **Figure 11** to support this statement.

[1 mark]

0 8 . 4 What could be limiting the rate of photosynthesis at a light intensity of 25 units?

Give **one** factor.

[1 mark]

Turn over for the next question

Draft

0 9

In 2014 there was an outbreak of Ebola virus disease (EVD) in Africa.

At the time of the outbreak there were:

- no drugs to treat the disease
- no vaccines to prevent infection.

0 9**. 1**

By March 2015 there were an estimated 9850 deaths worldwide from EVD.

The number of deaths is an estimate.

Suggest why it is **not** an exact number.

[1 mark]

0 9**. 2**

Why were antibiotics **not** used to treat EVD?

[1 mark]

After the outbreak began, drug companies started to develop drugs and vaccines for EVD.

The drug has to be thoroughly tested and trialled before it is licensed for use.

Testing, trialling and licensing new drugs usually takes several years.

- 0 9 . 3** Draw **one** line from each word about drug testing to the definition of the word. [2 marks]

Word about drug testing

Definition

Dose

Side effects making the person ill

Efficacy

The concentration of the drug to be used and how often the drug should be given

Toxicity

Whether the drug works to treat the illness

- 0 9 . 4** The results of drug testing and drug trials are studied in detail by other scientists. Then the results can then be published by the drug company. Suggest **one** reason why the results are studied by other scientists. [1 mark]

END OF QUESTIONS

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Figure 8: Leaf with TMV © Nigel Cattlin/Getty Images