

Please write clearly in block capitals.

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Centre number

Candidate
number

Surname

Forename(s)

Candidate signature

I declare this is my own work.

GCSE

COMBINED SCIENCE: TRILOGY

Foundation Tier Biology Paper 1

Practice Paper Series – Set 1

Time allowed: 1 hour 15 minutes

Materials

For this paper you must have:

- a ruler
- a scientific calculator.

Instructions

- Use black ink or black ball-point pen.
- Pencil should only be used for drawing.
- Fill in the boxes at the top of this page.
- Answer **all** questions in the spaces provided.
- Do not write outside the box around each page or on blank pages.
- If you need extra space for your answer(s), use the lined pages at the end of this book. Write the question number against your answer(s).
- Do all rough work in this book. Cross through any work you do not want to be marked.
- In all calculations, show clearly how you work out your answer.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 70.
- You are expected to use a calculator where appropriate.
- You are reminded of the need for good English and clear presentation in your answers.
- When answering question 08.3 you need to make sure that your answer:
 - is clear, logical, sensibly structured
 - fully developed
 - shows how the points that you make are related or follow on from each other where appropriate.

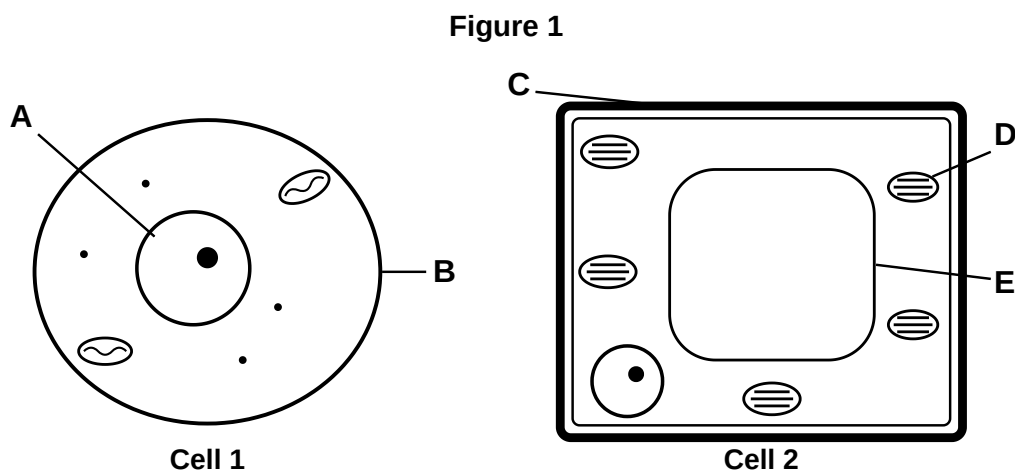
For Examiner's Use

Question	Mark
1	
2	
3	
4	
5	
6	
7	
8	
9	
TOTAL	

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sciencegcse.co.uk | Practice Paper Series – Set 1 | SGC/S1/B/1F

0 1 Figure 1 shows two types of cell.



0 1 . 1 Name the structures labelled **A** and **B** in Cell 1. [2 marks]

A

B

0 1 . 2 Which structure controls what enters and leaves the cell? [1 mark]

Tick (✓) **one** box.

- | | |
|---------------|--------------------------|
| Cell membrane | ☐ |
| Cell wall | ☐ |
| Cytoplasm | ☐ |
| Nucleus | ☐ |

0 1 . 3 Complete the sentences. [2 marks]

Use words from the box.

chloroplasts mitochondria nucleus ribosomes

Photosynthesis takes place in the

Proteins are made in the

0 1 . 4 Cell 2 is a plant cell. [1 mark]

Give **one** structure in Cell 2 that is **not** found in Cell 1.

.....

Question 1 continues on the next page

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01.5

A student looked at Cell 1 using a microscope.

[2 marks]

The image of the cell was 30 mm wide.

The real width of the cell was 0.06 mm.

Calculate the magnification of the image.

Use the equation:

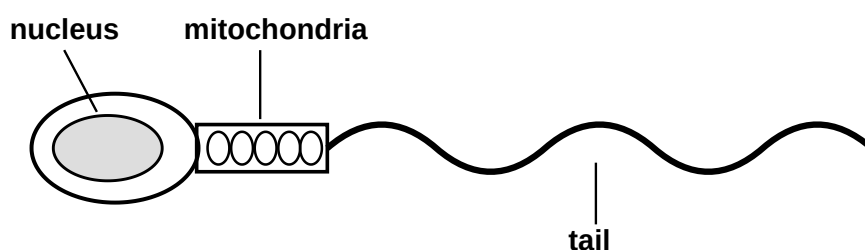
$$\text{magnification} = \frac{\text{size of image}}{\text{size of real object}}$$

Magnification = ×

02

Figure 2 shows a sperm cell.

Figure 2



02.1

Draw **one** line from each part of the sperm cell to its function.

[2 marks]

Part of sperm cell

Nucleus

Mitochondria

Tail

Function

Contains the genetic information

Makes proteins

Moves the cell

Releases energy

02.2

Cells become specialised as an organism develops.

[1 mark]

What is the name of this process?

.....

Question 2 continues on the next page

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0 2 . 3 Stem cells can be used to treat some medical conditions. [1 mark]
What is a stem cell?

0 2 . 4 Where are stem cells found in an adult human? [1 mark]
Tick (✓) **one** box.

- Bone marrow ☐
- Fingernails ☐
- Hair ☐
- Red blood cells ☐

0 2 . 5 Scientists tested a stem cell treatment for a type of blindness.
Table 1 shows the results.

Table 1

Group	Number of patients	Number whose eyesight improved	Number who developed an infection
Treated with stem cells	40	28	3
Not treated	40	5	0

A newspaper headline said:

‘Stem cells cure blindness’

Give **two** reasons why this headline is **not** justified. [2 marks]

Use **Table 1**.

1

2

Turn over for the next question

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0 3 A student investigated osmosis in carrot.

This is the method used.

1. Cut four strips of carrot, each 50 mm long.
2. Put each strip into a different concentration of salt solution.
3. Measure the length of each strip after 30 minutes.

Table 2 shows the results.

Table 2

Concentration of salt solution in mol/dm ³	Length of strip at start in mm	Length of strip after 30 minutes in mm
0.0	50	54
0.2	50	51
0.4	50	48
0.6	50	45

0 3 . 1 Which process caused the length of the strips to change? [1 mark]

Tick (✓) **one** box.

Active transport

☐

Osmosis

☐

Photosynthesis

☐

Respiration

☐

0 3 . 2 Give **two** variables the student should keep the same in this investigation. [2 marks]

1

.....

2

.....

0 3 . 3 Calculate the percentage change in length of the strip in the 0.6 mol/dm³ solution. [2 marks]

Percentage change = ... %

Question 3 continues on the next page

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0 3 . 4 The 0.0 mol/dm³ solution was distilled water. [2 marks]

Explain why the strip in the distilled water increased in length.

0 3 . 5 Estimate the concentration of salt solution in which the strip would **not** change length. [1 mark]

Use **Table 2**.

Concentration = _____ mol/dm³

0 3 . 6 The student measured each strip only once. [1 mark]

Suggest how the student could improve the investigation.

0 4 Enzymes in the digestive system break down large food molecules.

0 4 . 1 Complete **Table 3**. [3 marks]

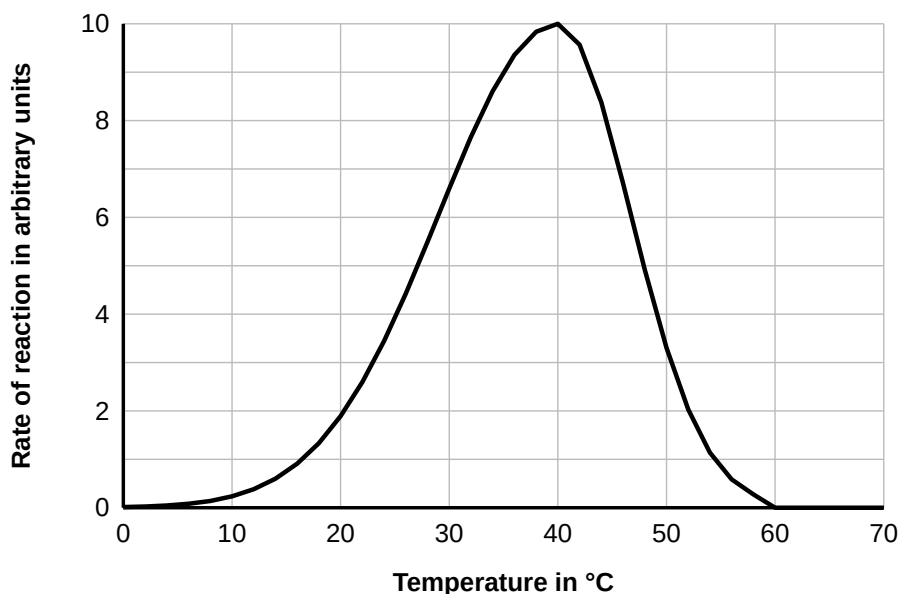
Table 3

Enzyme	Where the enzyme is produced	Large molecule broken down	Products
Amylase		Starch	Sugars
Protease	Stomach		Amino acids
Lipase	Pancreas	Lipids (fats)	

Question 4 continues on the next page

Figure 3 shows how temperature affects the rate of a reaction catalysed by lipase.

Figure 3



0 4 . 2 What is the optimum temperature for lipase? [1 mark]

Use Figure 3.

Optimum temperature = ... °C

0 4 . 3 Describe **and** explain what happens to the rate of reaction as the temperature increases from 40 °C to 60 °C. [3 marks]

Use Figure 3.

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0 4 . 4 Enzymes are biological catalysts. [1 mark]

What does a catalyst do?

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Turn over for the next question

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0 5 Smoking is a risk factor for lung cancer.

0 5 . 1 What is meant by a **risk factor**? [1 mark]

Scientists studied 10 000 people for 20 years.

Table 4 shows the results.

Table 4

	Number of people in the study	Number who developed lung cancer
Non-smokers	8000	24
Smokers	2000	72

0 5 . 2 Calculate the percentage of smokers who developed lung cancer. [2 marks]

Percentage of smokers = ... %

0 5 . 3 0.3% of the non-smokers developed lung cancer. [1 mark]

How many times more likely were smokers to develop lung cancer than non-smokers?

Number of times more likely = ...

0 5 . 4 A student concluded: [2 marks]

‘This study proves that smoking causes lung cancer.’

Give **two** reasons why the study does **not** prove this.

1

2

0 5 . 5 Lung cancer is caused by cells dividing in an uncontrolled way to form a tumour. [2 marks]

Describe the difference between a **benign** tumour and a **malignant** tumour.

0 6 Gonorrhoea is a sexually transmitted disease (STD).

0 6 . 1 What type of pathogen causes gonorrhoea? [1 mark]

Tick (✓) **one** box.

Bacterium

☐

Fungus

☐

Protist

☐

Virus

☐

0 6 . 2 Give **one** way the spread of gonorrhoea can be reduced. [1 mark]

0 6 . 3 Gonorrhoea can be treated with antibiotics. [2 marks]

Explain why antibiotics cannot treat viral diseases and why developing antiviral drugs is difficult.

Question 6 continues on the next page

06.4

In January 2023 a town started a campaign to reduce the spread of gonorrhoea.

Table 5 shows the number of new cases of gonorrhoea in the town each year.

Table 5

Year	Number of new cases
2021	480
2022	500
2023	410
2024	380

A student concluded:

[2 marks]

‘The campaign has stopped gonorrhoea spreading in the town.’

Give **two** reasons why the data in **Table 5** do **not** fully support this conclusion.

1

2

06.5

The body has non-specific defences against pathogens.

[2 marks]

Complete the sentences.

Use words from the box.

acid	antibodies	barrier	mucus
------	------------	---------	-------

The skin acts as a to stop pathogens entering the body.

The stomach produces which kills pathogens.

07

Measles is a disease caused by a virus.

Most children are vaccinated against measles.

07.1

How is the measles virus spread from person to person?

[1 mark]

Tick (✓) **one** box.

By inhaling droplets from coughs and sneezes

☐

By mosquito bites

☐

In contaminated food

☐

By touching infected plants

☐

07.2

Describe how vaccination protects a child against measles.

[3 marks]

Table 6 shows the percentage of children vaccinated against measles in one country, and the number of measles cases, in three different years.

Table 6

Year	Percentage of children vaccinated against measles	Number of measles cases
2010	95	120
2014	85	640
2018	92	260

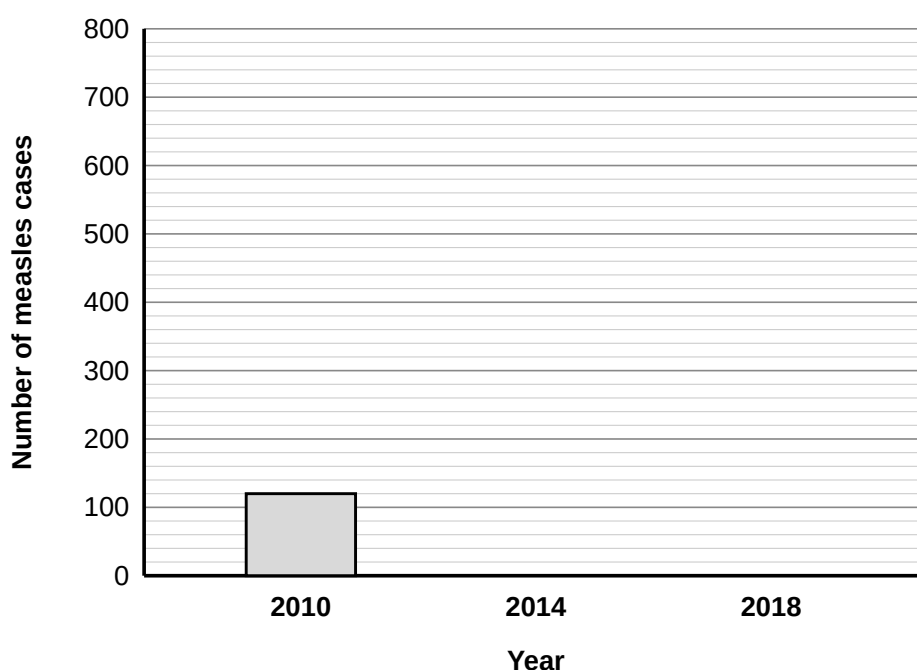
07.3

Complete the bar chart in **Figure 4** to show the number of measles cases in 2014 and in 2018.

[2 marks]

The bar for 2010 has been drawn for you.

Figure 4



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0 7 . 4 Describe the relationship between the percentage of children vaccinated and the number of measles cases. [1 mark]

0 8 Plants make glucose by photosynthesis.

0 8 . 1 Complete the word equation for photosynthesis. [2 marks]

carbon dioxide + ... → + oxygen

0 8 . 2 Which statement about photosynthesis is correct? [1 mark]

Tick (✓) **one** box.

It is an endothermic reaction.

☐

It is an exothermic reaction.

☐

It takes place in the mitochondria.

☐

It uses oxygen.

☐

Question 8 continues on the next page

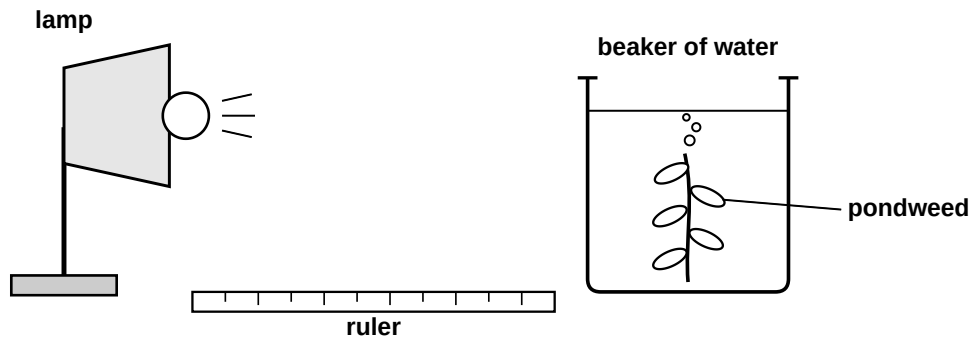
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08.3

A student wants to investigate how light intensity affects the rate of photosynthesis in pondweed.

Figure 5 shows some apparatus the student could use.

Figure 5



Plan an investigation the student could do.

[6 marks]

Your plan should include:

- how to change the light intensity
- how to measure the rate of photosynthesis
- how to make sure the results are valid.

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Turn over for the next question

0 9 A student measured her breathing at rest and during exercise.

Table 7 shows the results.

Table 7

	At rest	During exercise
Breathing rate in breaths per minute	14	30
Volume of each breath in dm ³	0.50	1.2

0 9 . 1 During hard exercise some of the student's muscle cells respire anaerobically. [1 mark]

Complete the word equation for anaerobic respiration in muscle cells.

glucose →

0 9 . 2 Calculate the total volume of air the student breathed in per minute during exercise. [2 marks]

Use **Table 7**.

Volume of air per minute = ... dm³

0 9 . 3 Explain why the student's breathing rate increased during exercise. [2 marks]

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.....

0 9 . 4 The student measured her breathing rate at rest only once. [1 mark]

Suggest how the student could get a more reliable value for her breathing rate at rest.

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END OF QUESTIONS

Additional page, if required.

Write the question numbers in the left-hand margin.

This image shows a full page of a document template designed for handwriting practice. It features a series of evenly spaced, horizontal black lines across the entire width of the page. The lines are thin and consistent in thickness, providing a guide for letter height and placement. There are no margins, text, or other markings present on the page.

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Additional page, if required.

Write the question numbers in the left-hand margin.

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There are no questions printed on this page

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