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Centre number

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Surname

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Forename(s)

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Candidate signature

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I declare this is my own work.

# GCSE COMBINED SCIENCE: TRILOGY

# F

Foundation Tier  
Biology Paper 2F

Monday 9 June 2025

Morning

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.
- 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 maximum mark for this paper is 70.
- 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.

| For Examiner's Use |      |
|--------------------|------|
| Question           | Mark |
| 1                  |      |
| 2                  |      |
| 3                  |      |
| 4                  |      |
| 5                  |      |
| 6                  |      |
| <b>TOTAL</b>       |      |



J U N 2 5 8 4 6 4 B 2 F 0 1

IB/M/Jun25/G4006/E9

8464/B/2F

**0 1**

The concentration of glucose in the blood can be controlled.

**0 1 . 1**

A person drinks a glucose solution.

What happens to the person's blood glucose concentration soon after drinking the glucose solution?

**[1 mark]**

Tick (✓) **one** box.

Blood glucose concentration decreases.

☐

Blood glucose concentration stays the same.

☐

Blood glucose concentration increases.

☐**0 1 . 2**

Insulin controls blood glucose concentration.

Which organ produces insulin?

**[1 mark]**

Tick (✓) **one** box.

Pancreas

☐

Pituitary

☐

Stomach

☐

**0 1 . 3** Organs affected by insulin are called target organs.

Which **two** organs are target organs for insulin?

**[2 marks]**

Tick (✓) **two** boxes.

Liver

☐

Lung

☐

Muscle

☐

Ovary

☐

Spinal cord

☐

**0 1 . 4** Complete the sentences.

Choose answers from the box.

**[2 marks]**

**DNA**

**glucose**

**glycogen**

**urea**

Insulin causes cells to take in \_\_\_\_\_.

The storage molecule made inside the cells is \_\_\_\_\_.

**Question 1 continues on the next page**



0 1 . 5

Complete the sentence.

Choose the answer from the box.

[1 mark]

increase

stay the same

decrease

Insulin causes blood glucose concentration to \_\_\_\_\_.

0 1 . 6

Type 2 diabetes is caused when the body cells no longer respond to insulin.

Give **two** ways to reduce the risk of developing Type 2 diabetes.Do **not** refer to insulin in your answer.

[2 marks]

1 \_\_\_\_\_

\_\_\_\_\_

2 \_\_\_\_\_

\_\_\_\_\_

9



0 2

Farmers can increase crop yield by controlling the conditions that plants grow in.

0 2 . 1

Draw **one** line from each substance to how the substance increases crop yield.**[2 marks]****Substance****How the substance increases  
crop yield**

Fertiliser

Adds mineral ions  
to the soilDecreases carbon dioxide  
concentration in the soil

Herbicide

Increases oxygen  
concentration in the airKills weeds that compete  
with crops

0 2 . 2

**Figure 1** shows a food chain for a farmer's field.**Figure 1**

Seeds → Mice → Owls

Which is the secondary consumer in the food chain?

**[1 mark]**Tick (✓) **one** box.

Seeds

☐

Mice

☐

Owls

☐

0 2 . 3

Bees are insects that live in hives.

The bees fly in and out of the hives.

**Figure 2** shows a crop growing in a field.

The farmer has added bee hives to increase the number of bees in the field.

**Figure 2**



Increasing the number of bees and other insects increases crop yield.

Which are **two** ways that increasing the number of insects in an area will increase crop yield?

**[2 marks]**

Tick (✓) **two** boxes.

Insects change the soil pH around the crop.

☐

Insects eat leaves from the crop.

☐

Insects eat pests on the crop.

☐

Insects pollinate the crop.

☐

Insects shelter in the crop.

☐


0 2 . 4

Some farmers increase the size of hedgerows between fields where crops grow.

Suggest **one** reason why.

[1 mark]

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Peat comes from peat bogs.

0 2 . 5

Peat can be used to produce garden compost.

**Table 1** compares peat compost with a sample of soil.

**Table 1**

|              | Mineral ion<br>concentration | Speed at which water<br>drains through |
|--------------|------------------------------|----------------------------------------|
| Peat compost | Low                          | Slow                                   |
| Soil         | High                         | Fast                                   |

Young plants have short roots.

Explain **one** advantage of growing young plants in peat compost instead of in soil.

[2 marks]

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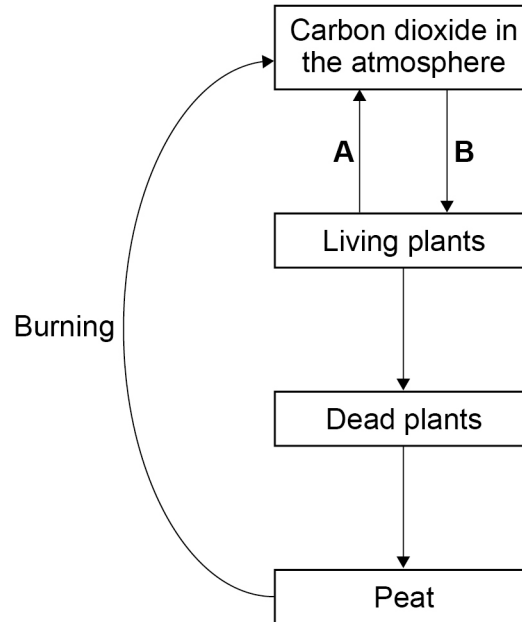
**Question 2 continues on the next page**



Peat can also be burnt as fuel.

**Figure 3** shows part of the carbon cycle.

**Figure 3**



**0 2 . 6** Name process **A** and process **B**.

Choose answers from the box.

**[2 marks]**

condensation

photosynthesis

respiration

transpiration

Process **A** \_\_\_\_\_

Process **B** \_\_\_\_\_



**0 2 . 7** Peat contains carbon compounds.

Explain why burning peat contributes to climate change.

**[2 marks]**

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**0 2 . 8** Decay is an important process in the carbon cycle.

Which **two** types of organism cause decay?

**[2 marks]**

Tick (✓) **two** boxes.

Algae

☐

Animals

☐

Bacteria

☐

Fungi

☐

Plants

☐

**0 2 . 9** Deforestation affects the carbon cycle.

Give **one** use of the land after the land has been cleared by deforestation.

**[1 mark]**

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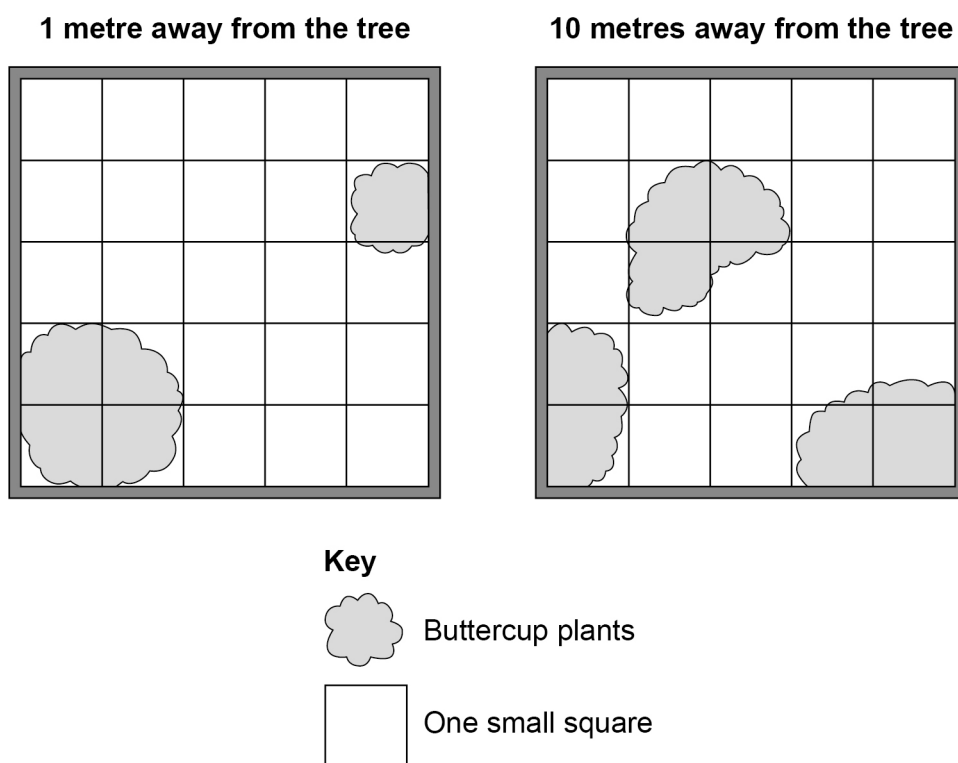
**0 3**

Buttercups are small plants.

A student investigated the distribution of buttercup plants at different distances from a tree.

**Figure 4** shows a piece of equipment being used to sample two areas.

**Figure 4**

**0 3 . 1**

What is the scientific name of the equipment shown in **Figure 4**?

**[1 mark]**

Tick (✓) **one** box.

Grid

☐

Quadrat

☐

Transect

☐


0 3 . 2

Each small square on **Figure 4** represents a percentage cover of 4%.

The student counted every small square that was **at least half** covered by buttercup plants.

At 1 metre away from the tree, buttercup plants had a percentage cover of 20%.

Determine the percentage cover of buttercup plants at **10 metres** away from the tree.

Use **Figure 4**.

[2 marks]

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Percentage cover = \_\_\_\_\_ %

0 3 . 3

What is the independent variable in the investigation?

[1 mark]

Tick (✓) **one** box.

Distance from the tree

☐

Number of species

☐

Time of year

☐

0 3 . 4

What is an advantage of calculating percentage cover instead of counting the number of buttercup plants in an area?

[1 mark]

Tick (✓) **one** box.

Percentage cover is affected by the number and size of individual plants.

☐

Percentage cover is always the same for individual plants of any species.

☐

Percentage cover is larger than the number of individual plants.

☐


The student investigated the percentage cover of buttercup plants around a different tree.

**Table 2** shows the results.

**Table 2**

| Distance from the tree in metres | Percentage (%) cover |          |          |          |          |          |
|----------------------------------|----------------------|----------|----------|----------|----------|----------|
|                                  | Result 1             | Result 2 | Result 3 | Result 4 | Result 5 | Mean     |
| 1                                | 12                   | 8        | 4        | 12       | 4        | <b>X</b> |
| 10                               | 24                   | 12       | 8        | 28       | 8        | 16       |

**0 3 . 5** Calculate mean value **X** in **Table 2**.

**[2 marks]**

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**X** = \_\_\_\_\_ %

**0 3 . 6** Give **one** conclusion about the effect of distance from the tree on the percentage cover of buttercup plants.

Use **Table 2**.

**[1 mark]**

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0 3 . 7

Give **two** other factors that affect the percentage cover of buttercup plants around the tree.

Do **not** refer to distance from the tree.

[2 marks]

1 \_\_\_\_\_

\_\_\_\_\_

2 \_\_\_\_\_

\_\_\_\_\_

0 3 . 8

**Table 2** shows the results of the investigation.

Suggest **two** improvements to the investigation.

[2 marks]

1 \_\_\_\_\_

\_\_\_\_\_

2 \_\_\_\_\_

\_\_\_\_\_

12

Turn over for the next question

Turn over ►

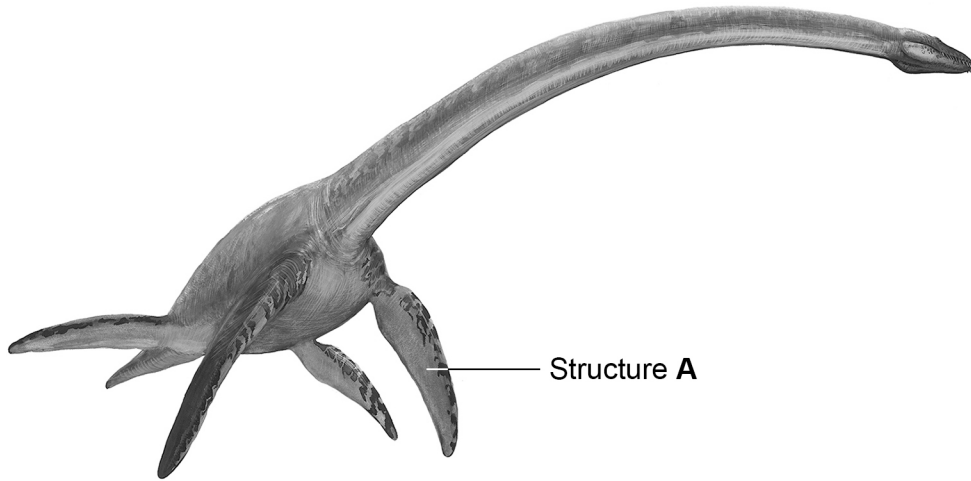


0 4

Plesiosaurs are extinct animals that lived in the ocean.

**Figure 5** shows what scientists think a living plesiosaur may have looked like.

**Figure 5**



0 4

1

Scientists think that the plesiosaur had smooth skin.

Suggest why the scientists **cannot** be certain what the skin of the plesiosaur was like.

**[1 mark]**

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0 4

2

Explain how structure **A** in **Figure 5** helped the plesiosaur survive in the ocean.

**[2 marks]**

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|   |   |   |   |
|---|---|---|---|
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|---|---|---|---|

Plesiosaurs may have moved rapidly upwards to hold their heads above the water surface to search for prey.

What type of adaptation was the rapid upwards movement?

**[1 mark]**

Tick (✓) **one** box.

Behavioural

☐

Chemical

☐

Structural

☐

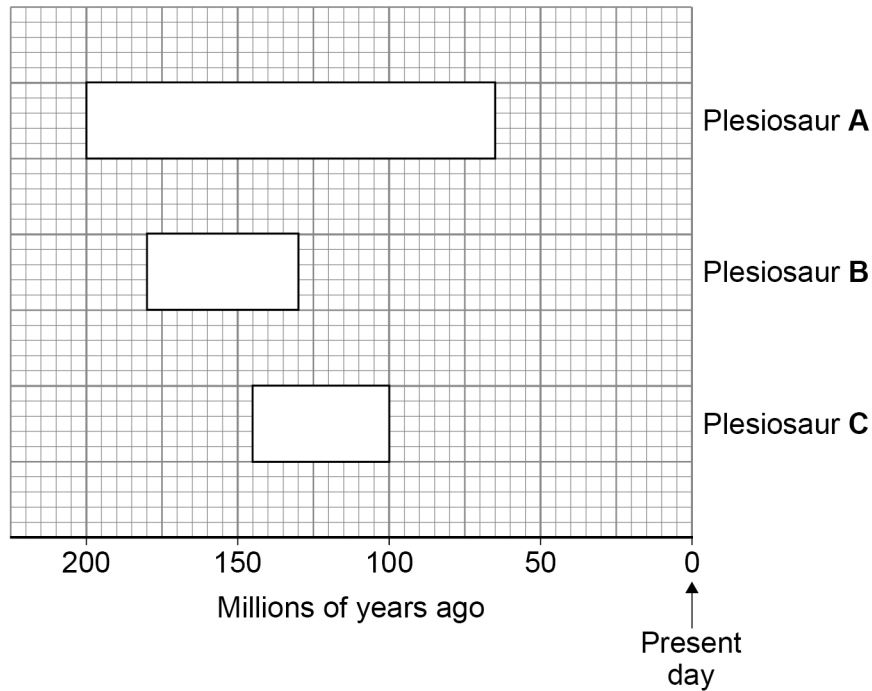
**Question 4 continues on the next page**



Scientists use fossils to estimate when different types of plesiosaur existed.

**Figure 6** shows when three types of plesiosaur existed.

**Figure 6**



**0 4 . 4** When did plesiosaur **A** first evolve?

Use **Figure 6**.

**[1 mark]**

\_\_\_\_\_ million years ago

**0 4 . 5** Determine how many million years plesiosaur **B** existed for.

Use **Figure 6**.

**[2 marks]**

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Time = \_\_\_\_\_ million years



**0 4 . 6** The exact year of extinction of all plesiosaur species can only be estimated.

Which are **two** reasons why?

**[2 marks]**

Tick (✓) **two** boxes.

All plesiosaurs will have formed fossils.

☐

Not all plesiosaur fossils have been discovered.

☐

Plesiosaur bones do not decay.

☐

Plesiosaurs had many predators.

☐

Some plesiosaur fossils will have been destroyed.

☐

**0 4 . 7** What evidence from **Figure 6** shows that plesiosaur **C** might have evolved from plesiosaur **B**?

**[1 mark]**

Tick (✓) **one** box.

Plesiosaur **B** and plesiosaur **C** did not exist at the same time.

☐

Plesiosaur **B** existed before plesiosaur **C**.

☐

Plesiosaur **B** became extinct more recently than plesiosaur **C**.

☐

**Question 4 continues on the next page**



**0 4 . 8** Evolution can be studied using evidence from:

- fossils
- antibiotic-resistant bacteria.

Suggest **two** reasons why it is easier to study evolution in bacteria than to study evolution using fossils.

**[2 marks]**

1 \_\_\_\_\_

\_\_\_\_\_

2 \_\_\_\_\_

\_\_\_\_\_

**0 4 . 9** Give **one** reason why doctors are concerned about antibiotic-resistant bacteria.

**[1 mark]**

\_\_\_\_\_

\_\_\_\_\_



0 5

This question is about genetics.

The fur colour of rabbits is controlled by two alleles.

0 5 . 1

Draw **one** line from each term to the meaning of the term relating to genetics in rabbits.

[3 marks]

| Term       | Meaning of the term                                         |
|------------|-------------------------------------------------------------|
| Chromosome | A fur colour that is seen                                   |
| Gene       | A whole strand of DNA found in the nucleus of a rabbit cell |
| Genome     | Codes for a protein that affects fur colour                 |
|            | The complete genetic composition of a rabbit                |

Question 5 continues on the next page

Turn over ►



0 5 . 2

In rabbits:

- the allele for brown fur (**B**) is dominant
- the allele for white fur (**b**) is recessive.

A rabbit with the alleles **Bb** and a rabbit with the alleles **bb** breed together.

Determine the probability that one of the offspring will have white fur.

You should:

- complete the Punnett square diagram
- identify any offspring that will have white fur.

**[5 marks]**

|  |  |  |
|--|--|--|
|  |  |  |
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|  |  |  |

Probability = \_\_\_\_\_



**0 5 . 3** A male rabbit is heterozygous for fur colour.

The rabbit's body cells have the genotype **Bb**.

One of the sperm cells from the rabbit has the allele **b**.

Explain why the alleles in the rabbit's body cells and the allele in the sperm cell are different.

**[2 marks]**

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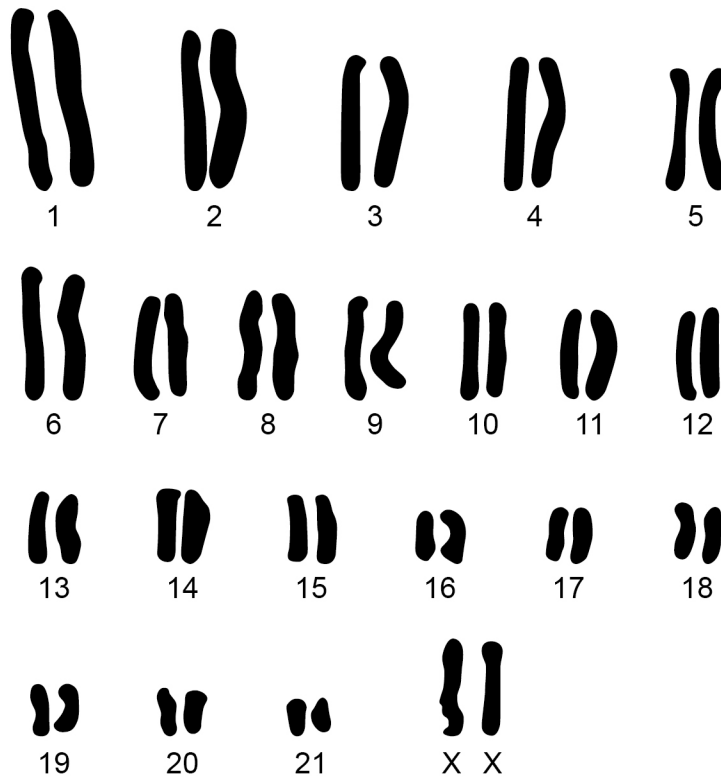
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**Question 5 continues on the next page**



**Figure 7** shows the chromosomes of a rabbit.

**Figure 7**



**0 5 . 4** How many chromosomes would be found in a skin cell of a rabbit?

Use **Figure 7**.

[1 mark]

Number of chromosomes = \_\_\_\_\_

**0 5 . 5** The sex of a rabbit is controlled in the same way as the sex of a human.

Give the evidence from **Figure 7** that the rabbit is female.

[1 mark]

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**0 6**

This question is about the hormones involved in reproduction.

**0 6 . 1**

Name **one** hormone produced in the **ovaries**.

**[1 mark]**

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**0 6 . 2**

Give **one** function of the hormone that is produced in the **testes**.

**[1 mark]**

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Different methods of contraception can involve:

- barriers
- hormones.

**0 6 . 3**

Condoms are a barrier method of contraception.

Give **one** advantage of condoms as a method of contraception compared with hormonal methods of contraception.

Do **not** refer to cost in your answer.

**[1 mark]**

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**Question 6 continues on the next page**



**[6 marks]**

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9



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ANSWER IN THE SPACES PROVIDED**



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2 8



2 5 6 G 8 4 6 4 / B / 2 F