Please write clearly in block capitals.

F

Centre number ☐☐☐☐☐ Candidate number ☐☐☐☐

Surname _____

Forename(s) _____

Candidate signature _____

I declare this is my own work.

GCSE

COMBINED SCIENCE: TRILOGY

Foundation Tier Biology Paper 2

Practice Paper Series – Set 2

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 05.1 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	

This is an original practice paper written for sciencegcse.co.uk to match the style and demand of AQA GCSE Combined Science: Trilogy (8464) Biology Paper 2 (Foundation Tier). It is not an AQA examination paper and has not been produced or endorsed by AQA. It is not a prediction of a future examination.

0 1 The nervous system allows humans to react to their surroundings.

0 1 . 1 Draw **one** line from each stimulus to the receptor cells that detect it. [2 marks]

Stimulus	Receptor cells
Light	Cells in the ear
Sound	Cells in the eye
Change in temperature	Cells in the skin
	Cells in the tongue

0 1 . 2 A cyclist sees a traffic light change to red. The cyclist pulls the brake lever. [2 marks]

The boxes show the parts of the body involved in this response. They are **not** in the correct order.

P	Motor neurone
Q	Receptor cells in the eye
R	Muscles in the arm
S	Sensory neurone
T	Brain

Write the letters in the boxes to show the correct order.

[ ] → [ ] → [ ] → [ ] → [ ]

0 1 . 3 The brain and the spinal cord form one part of the nervous system. [1 mark]

What is this part of the nervous system called?

.....

0 1 . 4 Pulling your hand away from a hot object is a reflex action. [2 marks]

Give **two** ways a reflex action is different from the cyclist's response.

1

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2

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Turn over for the next question

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0 2 Polydactyly is an inherited disorder. A person with polydactyly has extra fingers or toes.

Polydactyly is caused by a dominant allele, **D**. The recessive allele is **d**.

0 2 . 1 What is meant by a **dominant** allele? [1 mark]

.....

.....

0 2 . 2 What is the phenotype of a person with the genotype **dd**? [1 mark]

.....

0 2 . 3 A man and his partner both have polydactyly. They both have the genotype **Dd**. [2 marks]

Complete the Punnett square to show the possible genotypes of their children.

The man's gametes have been written in for you.

		Gametes from the man: **D**	Gametes from the man: **d**
Gametes from the partner			

0 2 . 4 What is the probability that a child of this couple will **not** have polydactyly? [1 mark]

Probability = ...

0 2 . 5 How many chromosomes are there in a human egg cell? [1 mark]

.....

Question 2 continues on the next page

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0 2 . 6 Embryos can be screened for some inherited disorders. [2 marks]

Give **one** reason for and **one** reason against screening embryos.

For

.....

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Against

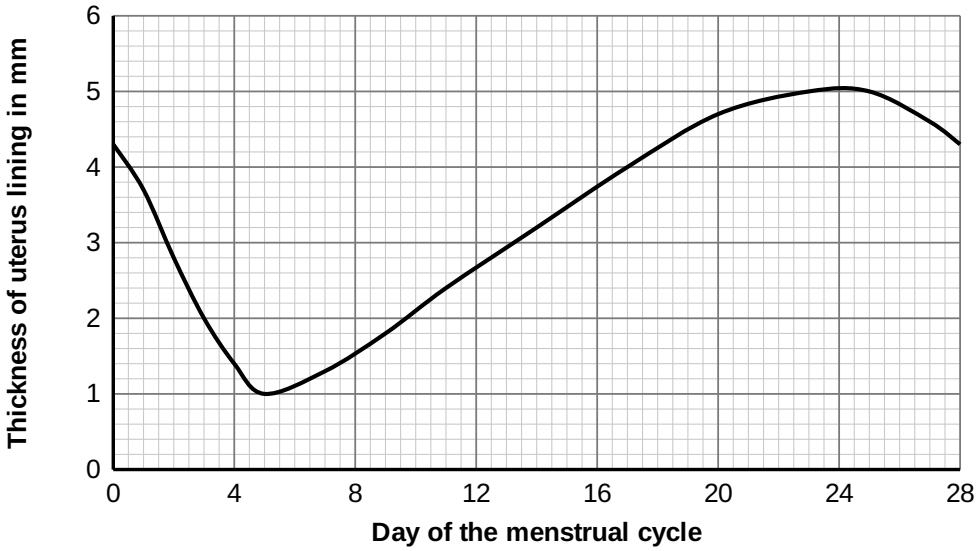
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0 3 Hormones control the menstrual cycle.

Figure 1 shows how the thickness of the lining of the uterus changes during one menstrual cycle.

Figure 1



0 3 . 1 Which hormone causes an egg to mature in an ovary? [1 mark]

Tick (✓) **one** box.

- Adrenaline ☐
- FSH ☐
- Insulin ☐
- Testosterone ☐

0 3 . 2 Describe what happens to the lining of the uterus between day 1 and day 5 [1 mark]

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0 3 . 3 Suggest why it is important that the lining of the uterus becomes thicker after day 5 [1 mark]

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.....

0 3 . 4 Name **one** hormone that helps to maintain the lining of the uterus. [1 mark]

.....

Table 1 shows the number of pregnancies in one year for every 100 women using three methods of contraception.

Table 1

Method of contraception	Number of pregnancies with perfect use	Number of pregnancies with typical use
Contraceptive skin patch	0.3	7
Condom	2	13
Intrauterine device (IUD)	0.6	0.8

0 3 . 5 'Perfect use' means always using the method exactly as instructed. [1 mark]

Suggest why there are more pregnancies with typical use of the skin patch than with perfect use.

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0 3 . 6 Compare how effective the condom and the IUD are at preventing pregnancy. [2 marks]

Use data from **Table 1**.

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0 3 . 7 Suggest why the number of pregnancies with the IUD is almost the same for perfect use and typical use. [1 mark]

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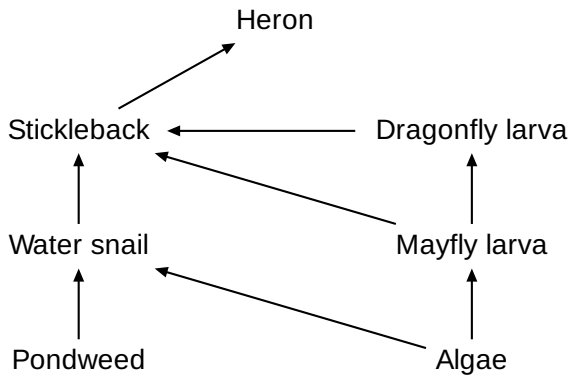
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0 4 **Figure 2** shows part of a food web in a pond.

Figure 2



0 4 . 1 What is meant by a **community**? [1 mark]

.....

.....

0 4 . 2 Name **one** organism in **Figure 2** that is both a predator and prey. [1 mark]

.....

0 4 . 3 The pondweed and the algae compete with each other. [2 marks]

Give **two** resources that they compete for.

1 .....

2 .....

0 4 . 4 A disease kills most of the sticklebacks in the pond. [2 marks]

Predict how the number of dragonfly larvae would change.

Explain your answer.

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0 4 . 5 Water snails have a hard shell. [1 mark]

Suggest how this adaptation helps a water snail to survive.

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0 4 . 6 Give **one** reason why producers are essential in a food chain. [1 mark]

0 5 Farmers use selective breeding to produce animals with useful characteristics.

0 5 . 1 A farmer keeps sheep. The farmer wants to produce sheep with thicker wool. [6 marks]

Describe how the farmer could use selective breeding to produce sheep with thicker wool.

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0 5 . 2 Selective breeding can lead to inbreeding. [2 marks]

Explain why inbreeding can be a problem.

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0 6 A student used a computer program to investigate the effect of practice on her reaction time.

- She clicked the mouse as soon as a red square appeared on the screen.
- She did the test five times on day 1
- She then practised every day and did the test five times again on day 5

Table 2 shows the results.

Table 2

	Reaction time in seconds				
	Test 1	**Test 2**	**Test 3**	**Test 4**	**Test 5**
Day 1	0.312	0.298	0.305	0.420	0.301
Day 5	0.268	0.260	0.272	0.266	0.264

0 6 . 1 Why did the student do the test five times on each day? [1 mark]

.....

.....

0 6 . 2 One of the results on day 1 is anomalous. [2 marks]

Calculate the mean reaction time on day 1

Do **not** include the anomalous result.

Mean reaction time = ... s

0 6 . 3 The mean reaction time on day 5 was 0.266 s [1 mark]

Describe the effect of practice on the student's reaction time.

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0 6 . 4 Calculate the range of the results on day 5 [1 mark]

Range = ... s

0 6 . 5 Reaction time can also be measured by catching a ruler that another person drops. [2 marks]

Give **two** advantages of using the computer program rather than the ruler-drop test.

1 .....

2 .....

0 6 . 6 Give **one** variable the student should have kept the same. [1 mark]

.....

0 7 Some students investigated how the percentage cover of plantain plants changed with distance from a footpath.

The students placed quadrats at 1 m intervals along a transect line from the edge of the path.

0 7 . 1 Give **one** reason why the students placed the quadrats along a transect rather than at random. [1 mark]

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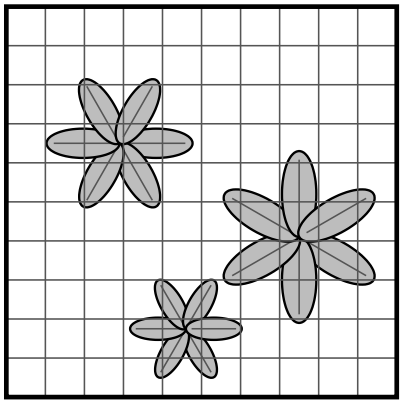
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Question 7 continues on the next page

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Figure 3 shows one of the quadrats. The quadrat is divided into 100 squares.

Figure 3



0 7 . 2 Estimate the percentage cover of plantain in this quadrat. [1 mark]

Count a square only if more than half of it is covered.

Percentage cover = ... %

The students placed quadrats along three transects. **Table 3** shows the results.

Table 3

Distance from the path in m	Percentage cover of plantain			
	Transect 1	Transect 2	Transect 3	Mean
0	40	36	38	38
1	33	30	33	32
2	25	29	27	27
3	22	18	20	**X**
4	13	17	15	15
5	9	7	8	8

0 7 . 3 Calculate mean **X**. [1 mark]

X = ... %

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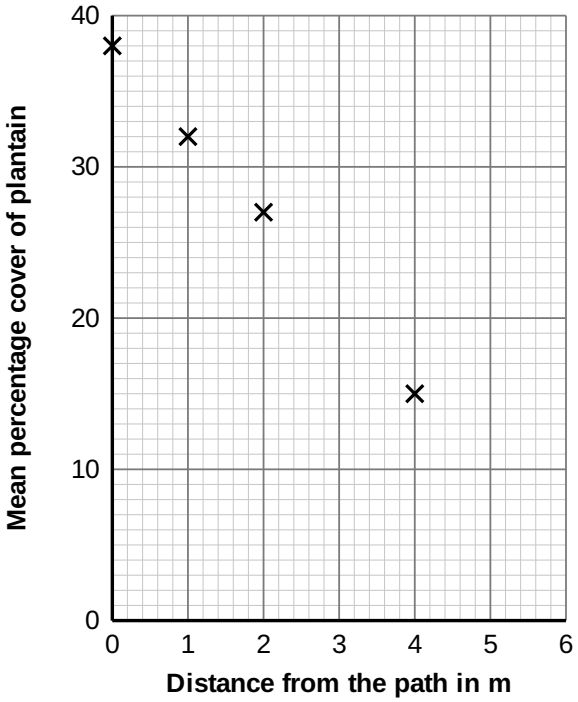
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0 7 . 4 **Figure 4** shows some of the mean results. [2 marks]

Complete **Figure 4**:

- plot the mean results for 3 m and 5 m
- draw a line of best fit.

Figure 4



0 7 . 5 Describe the relationship between the distance from the path and the percentage cover of plantain. [1 mark]

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.....

0 7 . 6 Plantain plants have leaves that grow flat on the ground. [1 mark]

Suggest why there was more plantain close to the path.

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0 7 . 7 Suggest **one** abiotic factor the students could also measure along the transects. [1 mark]

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Turn over for the next question

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0 8 Medium ground finches live on one of the Galápagos Islands. They eat seeds.

- Finches with deeper beaks can crack open larger, harder seeds.
- In 1977 there was a drought on the island.
- Most of the plants that produce small, soft seeds died.

Table 4 shows data about the finches.

Table 4

Year	Number of medium ground finches	Mean beak depth in mm
1976	1200	9.4
1978	180	9.9

0 8 . 1 No new finches hatched between 1976 and 1978 [2 marks]

Calculate the percentage of the finches that survived from 1976 to 1978

Percentage = ... %

0 8 . 2 In 1977 most of the plants that produce small, soft seeds died. The mean beak depth of the finches increased from 9.4 mm to 9.9 mm [3 marks]

Explain why natural selection increased the mean beak depth of the surviving finches.

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Question 8 continues on the next page

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0 8 . 3 In the 1980s there were several very wet years. Plants that produce small, soft seeds became common again. [2 marks]

Predict how the mean beak depth of the finches changed.

Give a reason for your answer.

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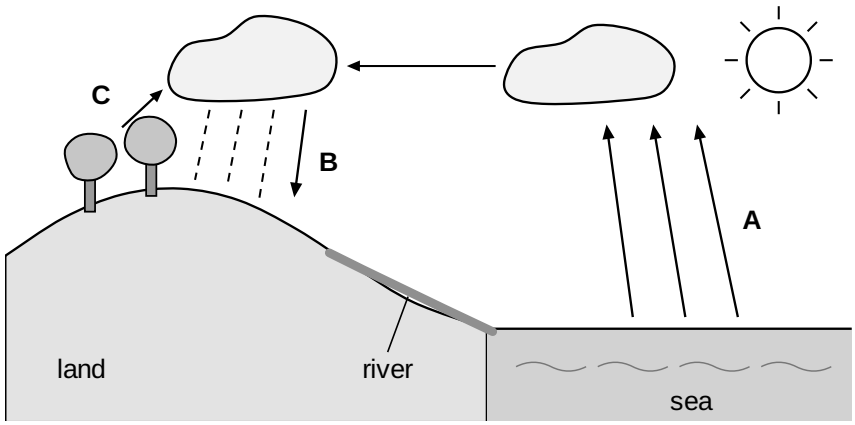
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0 9 **Figure 5** shows part of the water cycle.

Figure 5



0 9 . 1 Name processes **A**, **B** and **C**. [3 marks]

A .....

B .....

C .....

0 9 . 2 Explain why the water cycle is important for plants and animals that live on land. [2 marks]

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Question 9 continues on the next page

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0 9 . 3 A pond contained 420 m^3 of water in winter and 315 m^3 in summer. [2 marks]

Calculate the percentage decrease in the volume of water in the pond.

Percentage decrease = ... %

0 9 . 4 Suggest **one** reason why the volume of water in the pond decreased in summer. [1 mark]

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END OF QUESTIONS

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Additional page, if required.

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