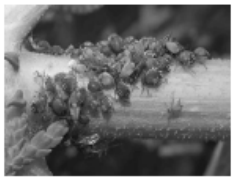
Trophic levels in an ecosystem – GCSE Combined Science Biology

1. No.5

0 5 **Figure 4** shows a food chain in a garden.

Figure 4


bean plant →

blackfly →

spider →

blackbird

0 5 . 1 Which term describes the spider in this food chain?

[1 mark]

Tick (✓) **one** box.

- Primary consumer ☐
- Producer ☐
- Secondary consumer ☐
- Tertiary consumer ☐

0 5 . 2 Many of the spiders in the garden died.

What is likely to happen to the number of blackflies in the garden?

[1 mark]

Tick (✓) **one** box.

- Decrease ☐
- Increase ☐
- Stay the same ☐

0 5 . 3 Give a reason for your answer to Question **05.2**

[1 mark]

Table 2 shows the estimated biomass of organisms in the garden.

Table 2

Organism	Biomass in g
Bean plants	225
Blackflies	115
Spiders	65
Blackbirds	10

0 5 . 4 What conclusion can be made about biomass in food chains?

[1 mark]

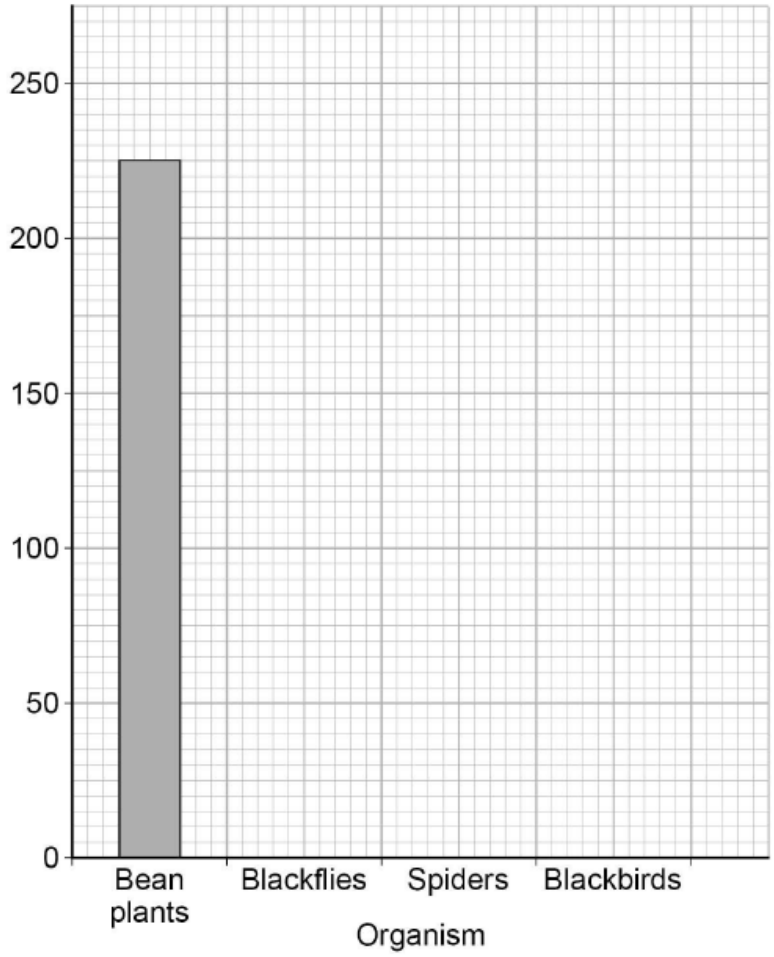
0 5 . 5 Complete **Figure 5**.

You should:

- label the y-axis
- plot the data from **Table 2**.

[3 marks]

Figure 5



0 5 . 6 Explain why a garden is **not** a stable community.

[2 marks]

2. No.1

0 1 Some students investigated the effect of drinking caffeine on reaction time.

They used a drink containing 32.25 mg of caffeine per 100 cm^3

This is the method used.

1. Divide the students into four groups, **A**, **B**, **C** and **D**.
2. Measure and record the reaction time of each student using the ruler-drop test.
3. Students in:
   - group **A** drink 200 cm^3 of water
   - group **B** drink 200 cm^3 of the caffeine drink
   - group **C** drink 400 cm^3 of the caffeine drink
   - group **D** drink 600 cm^3 of the caffeine drink.
4. Repeat step 2 after 15 minutes.

0 1 . 1 Describe how to do the ruler-drop test.

[3 marks]

0 1 . 2 **Table 1** shows the mass of caffeine taken in by each student.

Table 1

Group	Mass of caffeine in mg
A	0
B	64.5
C	129.0
D	**X**

Calculate value **X**.

[1 mark]

X = _____ mg

0 1 . 3 Why did group **A** drink water instead of the caffeine drink?

[1 mark]

Table 2 was used to convert the results of the ruler-drop test into reaction times.

Table 2

Distance in cm	Reaction time in s
2	0.064
4	0.090
6	0.111
8	0.128
10	0.143
12	0.156
14	0.169
16	0.181
18	0.192
20	0.202
22	0.212
24	0.221
26	0.230

Distance in cm	Reaction time in s
28	0.239
30	0.247
32	0.256
34	0.263
36	0.271
38	0.278
40	0.286
42	0.293
44	0.300
46	0.306
48	0.313
50	0.319
52	0.326

0 1 . 4 Estimate the reaction time for a student who recorded a distance of 23 cm

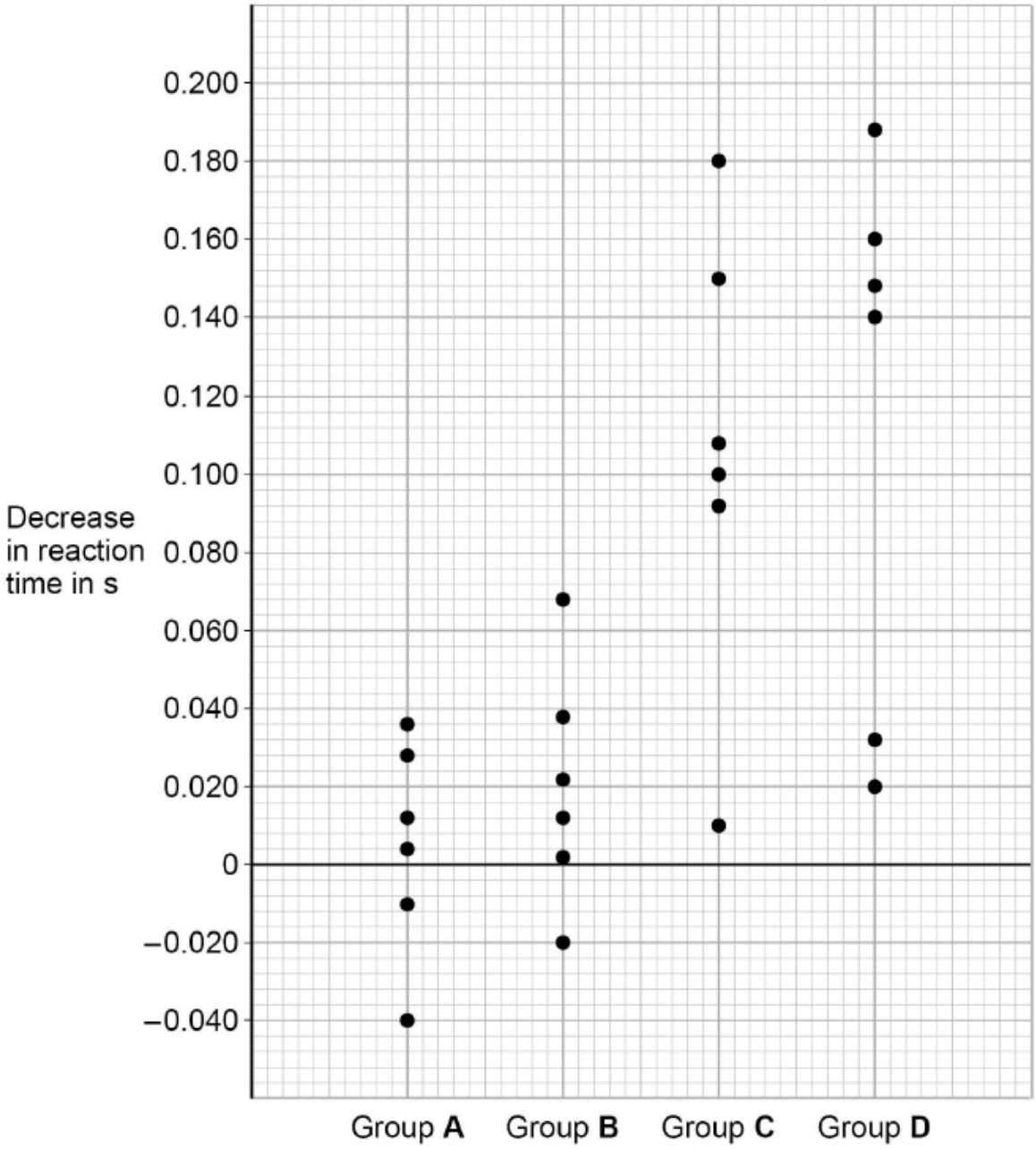
[1 mark]

Reaction time = _____ s

Students calculated the decrease in their reaction time after the drink compared with before the drink.

Figure 1 shows the results for each student.

Figure 1



0 1 . 5 Describe the effect of the mass of caffeine taken in on the decrease in reaction time.

[1 mark]

0 1 . 6 For three students the decrease in reaction time was negative.

Give the reason why the value was negative.

[1 mark]

0 1 . 7 What is the range of results for group **C**?

[1 mark]

0 1 . 8 Suggest **two** variables that should have been controlled in this investigation.

[2 marks]

1

2

0 1 . 9 Explain why the ruler-drop test does **not** involve a reflex action.

[2 marks]