

(Photosynthesis (equation, limiting factors, uses of glucose))

Q1.(2018)

Plants infected with aphids have stunted growth.

Explain **one** way the removal of dissolved sugars from the stem of the plant causes stunted growth.

[2 marks]

Q2.(2018)

Most aphids do not have wings when they hatch. After several generations, some aphids hatch which have wings and can fly.

Explain the advantage to the aphid of being able to fly.

[2 marks]

Q3.a)(2020)

This question is about photosynthesis.

Complete the word equation for photosynthesis.

[2 marks]

_____ + _____ → _____ + oxygen

Q3.b)(2020)

Describe how energy for the photosynthesis reaction is gained by plants.

[2 marks]

Q4.a)(2020)

Table 3 is repeated below.

Table 3

Temperature in °C	Rate of photosynthesis in cm ³ /hour			
	Test 1	Test 2	Test 3	Mean
20	18.5	19.3	19.5	X
25	32.6	34.1	32.9	33.2
30	41.9	45.2	44.9	44.0
35	38.6	39.8	44.0	40.8
40	23.1	20.5	22.4	22.0
45	1.9	14.2	2.2	2.1

Why did the rate of photosynthesis decrease from 35 °C to 45 °C?

[1 mark]

Q4.b)(2020)

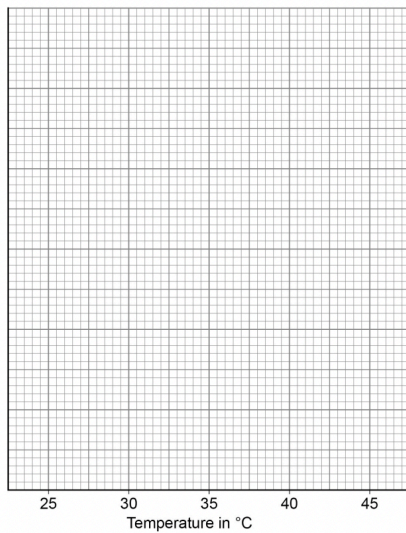
Complete Figure 10 using data from Table 3.

You should:

- label the y-axis
- use a suitable scale for the y-axis
- plot the mean data from Table 3 for temperatures from 25 °C to 45 °C
- draw a line of best fit.

[5 marks]

Figure 10



Q5.(2021)

Carbohydrates are needed as part of a balanced diet.

Which formula shows glucose?

[1 mark]

Tick (✓) **one** box.

C₆H₁₂O₆

☐

CO₂

☐

H₂O

☐

O₂

☐

Q6.a)(2022)

A scientist investigated the rate of photosynthesis of one type of tomato plant.

The tomato plants were grown in a greenhouse.

Table 2 shows the results.

Table 2

Percentage (%) concentration of carbon dioxide in the air	Rate of photosynthesis in arbitrary units
0.00	0
0.02	5
0.04	16
0.06	19
0.08	20
0.10	20
0.12	20

Give **two** control variables the scientist should have used in the investigation.

[2 marks]

1 _____

2 _____

Q6.b)(2022)

Which range of carbon dioxide concentrations caused the rate of photosynthesis to change the most?

[1 mark]

Tick (✓) **one** box.

From 0.00% to 0.02%

☐

From 0.02% to 0.04%

☐

From 0.04% to 0.06%

☐

From 0.06% to 0.08%

☐

Q6.c)(2022)

How could the scientist have improved the validity of the results?

[1 mark]

Tick (✓) **one** box.

Repeat each reading three times and calculate a mean.

☐

Use concentrations of carbon dioxide above 0.12%.

☐

Use different tomato plants for each concentration.

☐

Q6.d)(2022)

Explain the change in the rate of photosynthesis when the concentration of carbon dioxide increased between 0.00% to 0.08%.

[2 marks]

Q6.e)(2022)

A farmer decided **not** to use a concentration of carbon dioxide higher than 0.08% to grow tomato plants.

Suggest **two** reasons for the farmer's decision.

Use information from **Table 2** and your own knowledge.

[2 marks]

1

2

Q7.(2022)

Plants take up water from the soil through their roots.

Some of the water is used for photosynthesis.

Complete the word equation for photosynthesis.

Choose answers from the box.

[2 marks]

fat	glucose	nitrogen	oxygen	protein
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carbon dioxide + water → _____ + _____

Q8.a)(2023)

Photosynthesis produces oxygen.

Complete the word equation for photosynthesis.

Choose answers from the box.

[3 marks]

carbon dioxide	fat	glucose
nitrogen	protein	water

_____ + _____ → _____ + oxygen

Q8.b)(2023)

Explain how oxygen is used in cells.

[2 marks]
