

Q1. (2018)

A)

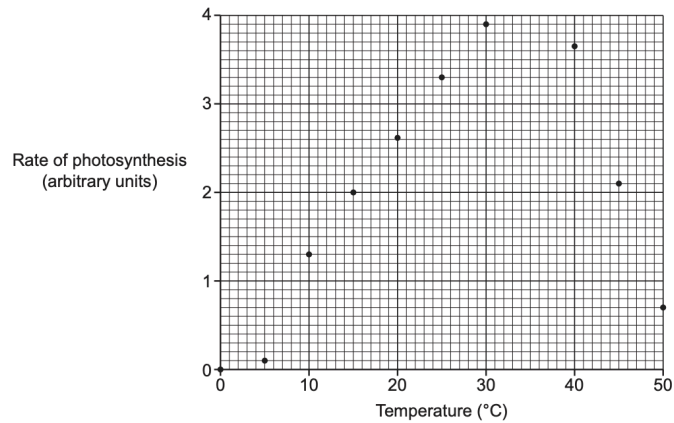
- 21 (a) Photosynthesis involves reactions that are endothermic.

What is meant by the term endothermic reaction?

.....[1]

B)

- (b) The graph is from an experiment to show the effect of temperature on the rate of photosynthesis.



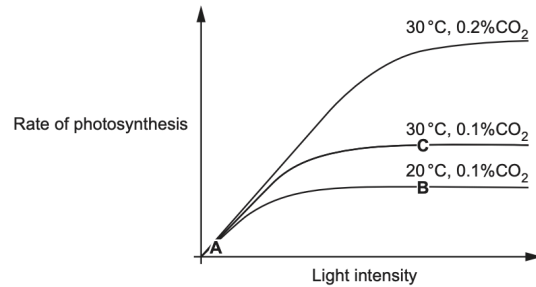
Draw a line of best fit.

[1]

C)

- (c) Look at the graph. It shows how light intensity affects the rate of photosynthesis.

The lines show different carbon dioxide concentrations and temperatures.



Explain what is limiting the rate of photosynthesis at the three points A, B and C on the graph.

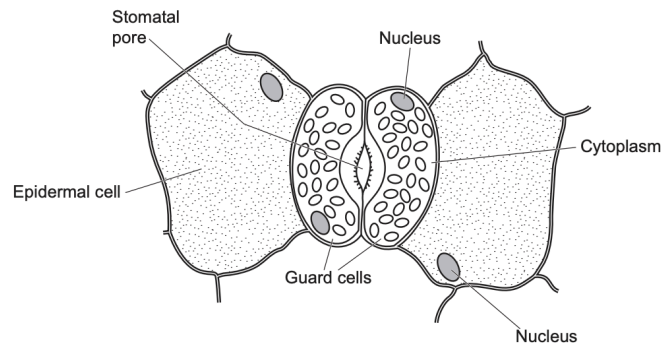
Use evidence from the graph in your answer.

.....

[3]

D)

(d) The diagram shows structures on the surface of a leaf.



(i) Photosynthesis occurs in the guard cells but not the epidermal cells.

Explain why this is important in the control of the rate of transpiration in the plant.

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..... [4]

E)

(ii) Explain why guard cells are an example of specialised cells.

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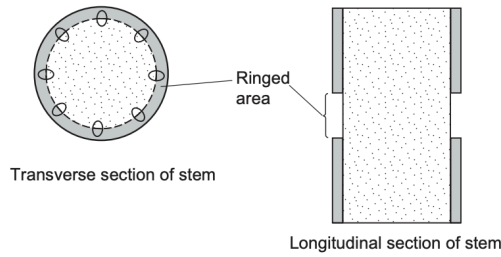
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..... [2]

F)

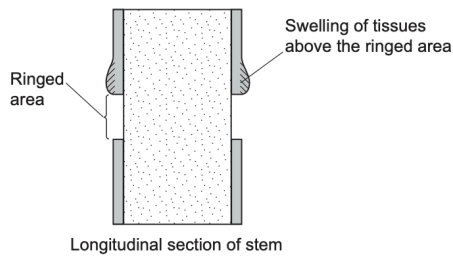
- (e) An experiment was done to look at the effect of 'ringing' on a tree trunk. Ringing removes a strip of plant tissue from around the stem of the tree.

The diagram shows where the stem is ringed.



The results were recorded after one week.

The diagram shows the results.



What conclusions can be made about the results?

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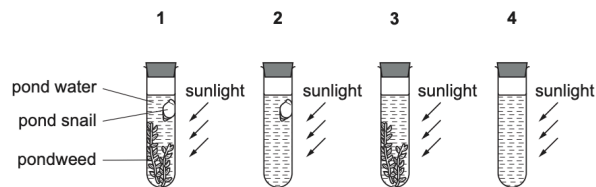
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..... [3]

Q2. (2019)

- 2 Pond snails and pondweed are living in water in sealed test tubes.



Carbon dioxide dissolves in water and forms an acid.

In which test tube would the water become most acidic?

- A 1
- B 2
- C 3
- D 4

Your answer

[1]

Q3. (2021)

- 9 Which description identifies the process of photosynthesis?
- A It is endothermic because heat energy is absorbed.
 - B It is endothermic because light energy is absorbed.
 - C It is exothermic because heat energy is absorbed.
 - D It is exothermic because light energy is absorbed.

Your answer

☐

[1]

Q4. (2021)

- 14 In experiments on photosynthesis, it is often necessary to compare different light intensities.

A plant 20 cm from a light receives a light intensity of 25 arbitrary units of light.

What light intensity does a plant receive 10 cm from the light?

- A 10
- B 50
- C 100
- D 1000

Your answer

☐

[1]

Q5. (2021)

- 17 Marimo moss balls are made up of green algae. They are found in lakes and are known to rise and fall during different times of the day. Fig. 17.1 shows some moss balls in a beaker of water.

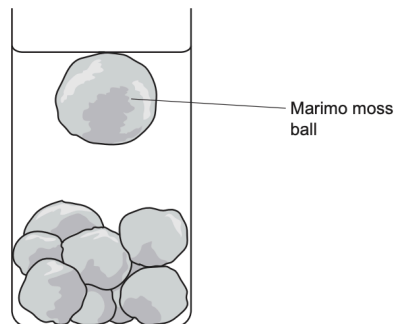


Fig. 17.1

Scientists predict that the moss balls rise because they are covered in tiny bubbles of oxygen.

A)

- (a) The scientists test their prediction by using a chemical that stops a biological process in the algae. When the chemical is added they found the moss balls did **not** rise.

- (i) Which biological process is affected by the chemical?

Tick (✓) **one** box.

- | | |
|----------------|--------------------------|
| Diffusion | ☐ |
| Osmosis | ☐ |
| Photosynthesis | ☐ |
| Respiration | ☐ |

[1]

B)

- (ii) Explain why the moss balls did **not** rise.

.....
 [1]

C)

(b) The scientists then investigate how exposure to light affects a moss ball which had been in the dark.

- In **Experiment 1**, a moss ball is exposed to 12 hours of light then 12 hours of darkness.
- In **Experiment 2**, the moss ball is exposed to continuous light for 24 hours.

They measure the height of the moss ball in a column of water.

Fig. 17.2 shows their results.

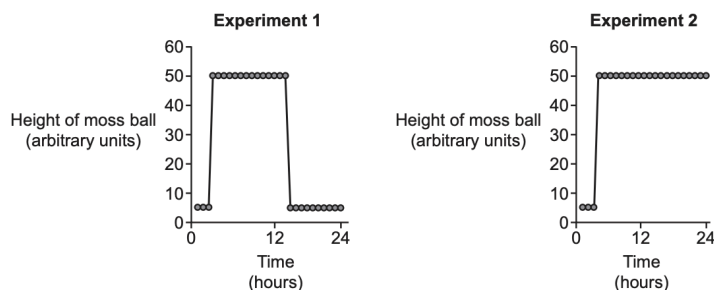


Fig. 17.2

(i) What conclusion can be made from **Experiment 1** about the effect of light on the position of the moss ball?

.....

 [2]

D)

(ii) Suggest an explanation for the differences between the two graphs.

.....

 [2]

E)

(c) Light is one environmental factor that affects plants.

Explain how increasing the temperature from 15 °C to 40 °C can affect plants.

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 [3]

Q6. (2022)

1 Which row shows the correct type of reaction for photosynthesis and for respiration?

		Photosynthesis	Respiration
Type of Reaction	A	endothermic	endothermic
	B	exothermic	exothermic
	C	endothermic	exothermic
	D	exothermic	endothermic

Your answer

☐

[1]

Q7. (2022)

15 In experiments about photosynthesis, it is often necessary to compare light intensities.

Which equation gives the light intensity at a distance (d) from a light source?

- A Light intensity = $1/d$
- B Light intensity = $1/d^2$
- C Light intensity = $d - 1$
- D Light intensity = $\frac{d \times 2}{1}$

Your answer

[1]

Q8. (2023)

2 Single-celled algae found in the ocean absorb large amounts of carbon dioxide.

Which process inside the cells of the algae uses this carbon dioxide?

- A Homeostasis
- B Photosynthesis
- C Respiration
- D Temperature regulation

Your answer

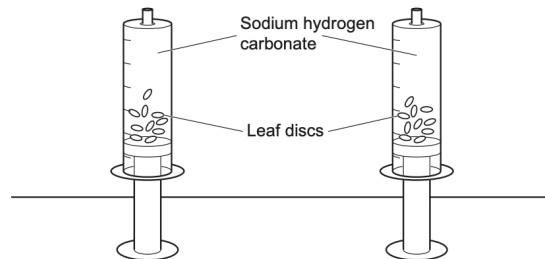
[1]

Q9. (2023)

22 A student investigates the rate of photosynthesis in two different species of plant.

The student's method:

- Cut 10 leaf discs from a leaf of one of the plants.
- Place the discs into a syringe containing sodium hydrogen carbonate solution.
- Repeat this using a leaf from the other plant.
- Record the time it takes for the leaf discs to rise to the top of each syringe.



A)

(a) Give **three** variables that the student must control to ensure that data collected for the two species of plant is valid.

- 1
- 2
- 3

[3]

B)

(b) Explain why the leaf discs rise to the top of the syringes.

-
- [1]

C)

- (c) Describe how the student could change their investigation to find the effect of light intensity on the rate of photosynthesis for **one** type of leaf.

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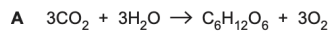
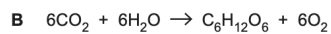
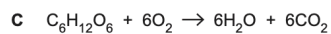
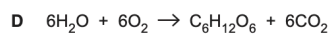
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Q10. (2024)

- 13 What is the balanced equation for photosynthesis?



Your answer

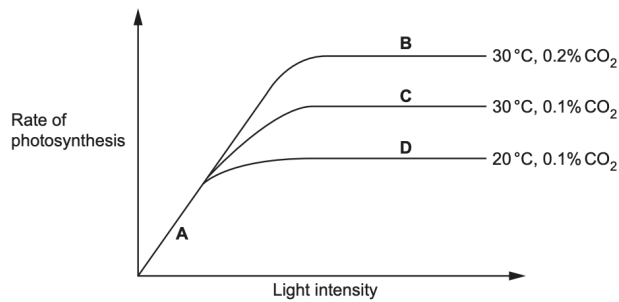
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[1]

Q11. (2024)

- 14 The graph shows the effect of light intensity, carbon dioxide concentration and temperature on the rate of photosynthesis.

At which point, A, B, C or D is light the limiting factor for photosynthesis?



Your answer

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[1]