

APOLLO

Photosynthesis

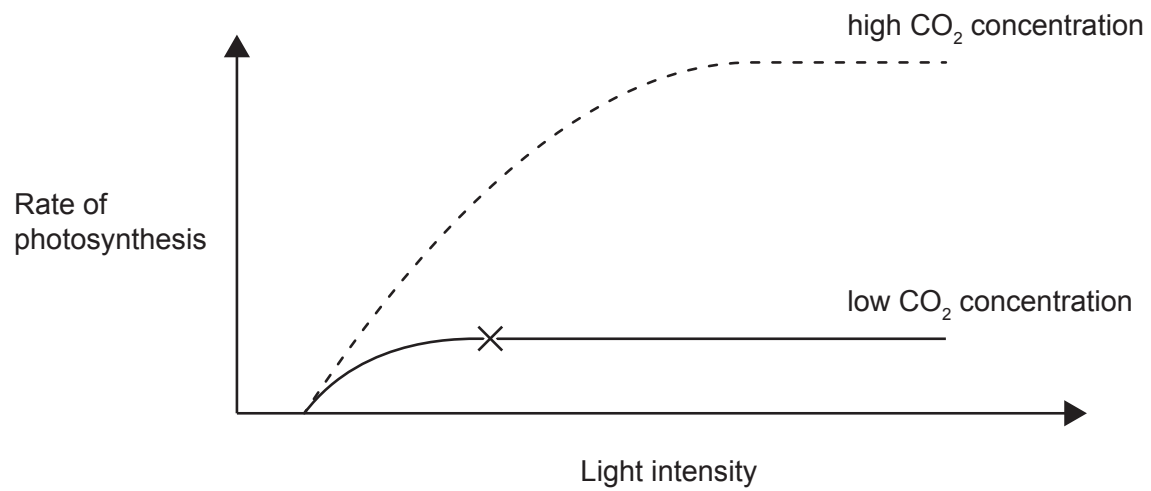
SL

Biology

First assessment 2025

6 questions | questions

4. The graph shows the effect of light intensity on the rate of photosynthesis of a green plant at different CO_2 concentrations. The temperature is kept constant at 25°C .

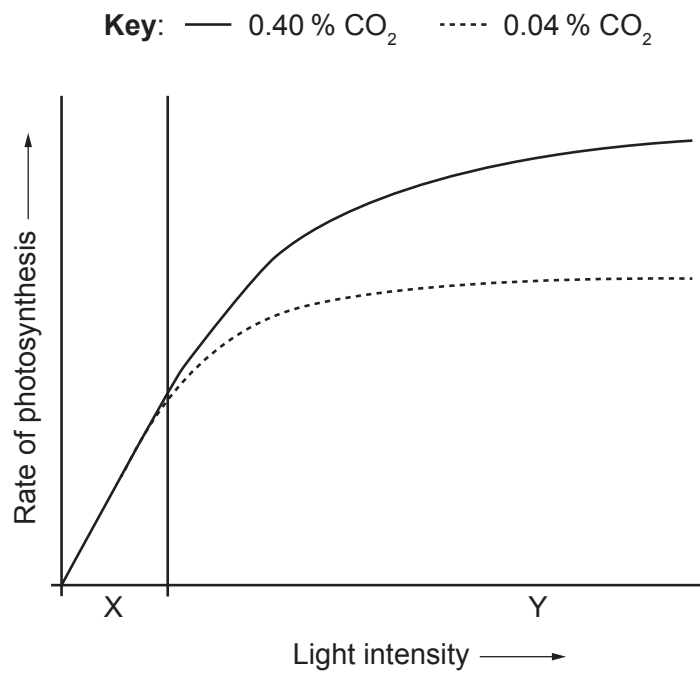


What is the limiting factor at x?

- A. Chlorophyll
- B. CO_2 concentration
- C. Temperature
- D. Light intensity

5. Bromothymol blue is an indicator that is initially blue and turns yellow when CO_2 is present. Tests were carried out varying the presence of a plant (*Elodea canadensis*) and a snail (*Marisa cornuarietis*) in an aquatic environment. What condition would produce a blue colour after sampling the water?
- A. Plant kept in the dark without snail
 - B. Plant and snail kept in the dark
 - C. Plant kept in the light without snail
 - D. Snail with no plant

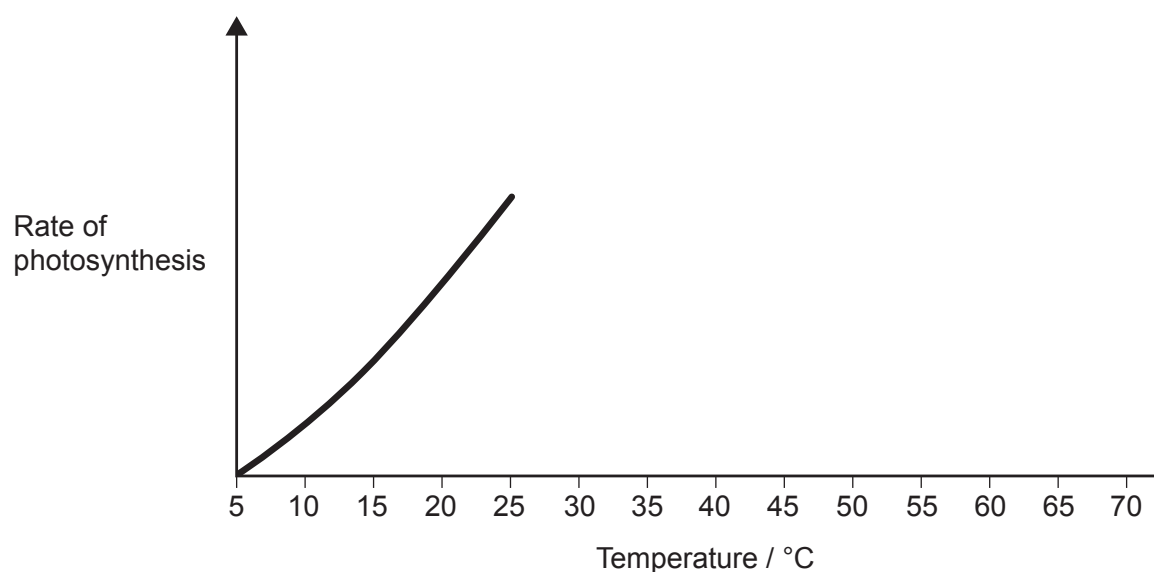
5. The graph shows the rate of photosynthesis as light intensity increases at two different carbon dioxide (CO₂) concentrations.



What are the limiting factors of photosynthesis at regions X and Y on the graph?

	X	Y
A.	CO ₂ concentration	light intensity
B.	temperature	light intensity
C.	light intensity	CO ₂ concentration
D.	light intensity	temperature

5. An experiment investigated the effect of temperature on the rate of photosynthesis of a plant. Results are shown for temperatures between 5 °C and 25 °C.

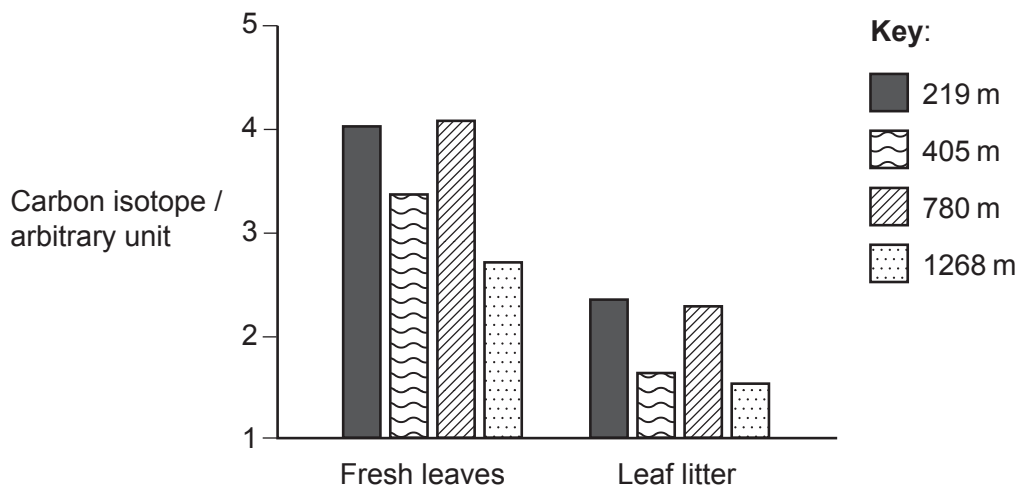


How would further increases in temperature, up to 70 °C, affect the rate of photosynthesis?

- A. It would decrease between 25 °C and 35 °C and then increase between 35 °C and 70 °C.
- B. It would continue increasing as temperature increases.
- C. It would increase to a maximum of between 30 °C and 40 °C and then decrease.
- D. It would peak above 25 °C and then remain constant.

2. A study was conducted on the presence of a form (isotope) of carbon, carbon-13 (^{13}C), in trees at four different altitudes of Lushan, a mountain in central subtropical China.

Samples of fresh leaves and leaf litter (dead leaves on the ground) were taken from altitudes between 219m and 1268m. The carbon isotope in the leaves was measured in each sample. Presence of the carbon isotope was measured to indicate the relative uptake of carbon dioxide in photosynthesis.



- (a) State the method that is used to measure changes in the distribution of organisms and abiotic factors across a specific distance.

[1]

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- (b) Compare and contrast the data for fresh leaves with the data for leaf litter.

[2]

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(Question 2 continued)

- (c) Suggest **one** abiotic variable that would affect the carbon isotope content of the fresh leaves at high altitudes. [1]

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- (d) Carbon enters a plant as carbon dioxide from the air. Outline the route that the gas takes to reach chloroplasts in a dicotyledonous plant. [2]

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Turn over



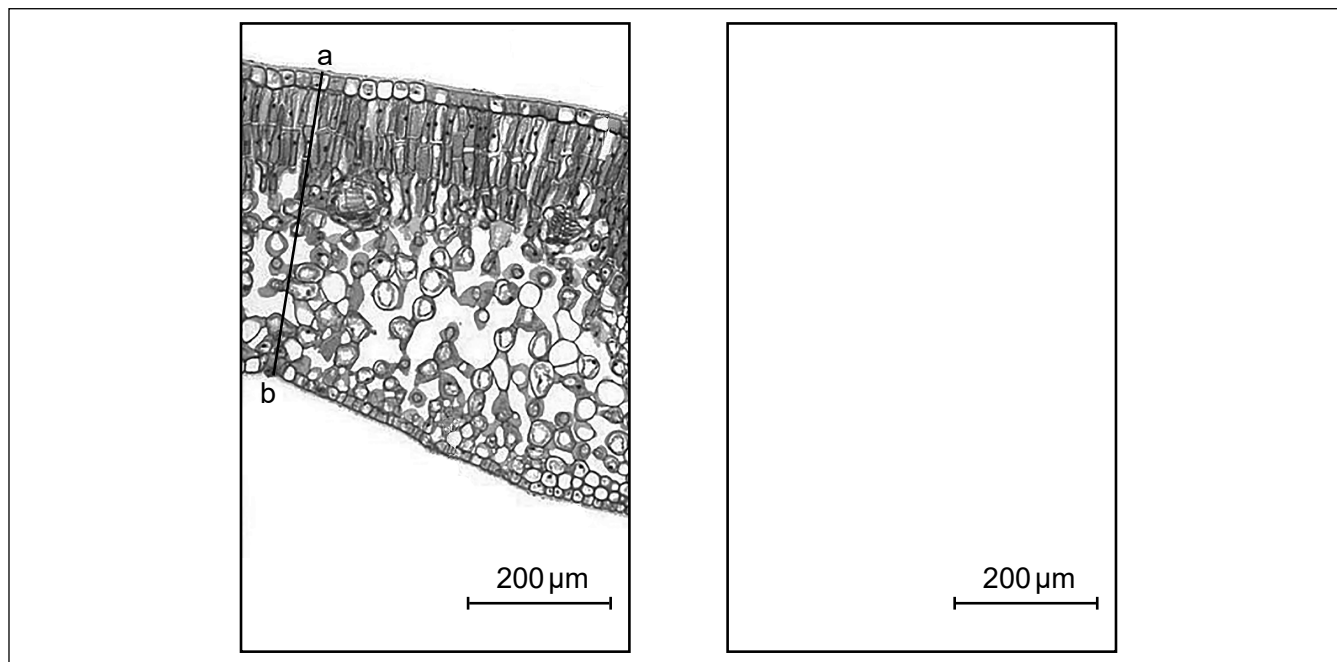
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Answers written on this page
will not be marked.



2. The micrograph shows a transverse section of a leaf from a flowering plant.



- (a) Draw a plan diagram in the right-hand box with labels to show the distribution of tissues in this transverse section of a leaf. [3]
- (b) Calculate the actual thickness of the leaf, from upper to lower surface along the line a–b, showing your working. [2]

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(Question 2 continued)

- (c) Suggest a reason for using a lower power objective lens when first focusing on a slide under the microscope. [1]

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- (d) Identify **one** adaptation of the leaf for the absorption of light visible in this micrograph. [1]

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