

Respiration, stored as insoluble starch, fats or oils for storage, cellulose for cell walls, combine with nitrates from the soil to form amino acids for protein synthesis

Describe photosynthetic organisms as the main producers of food and therefore biomass

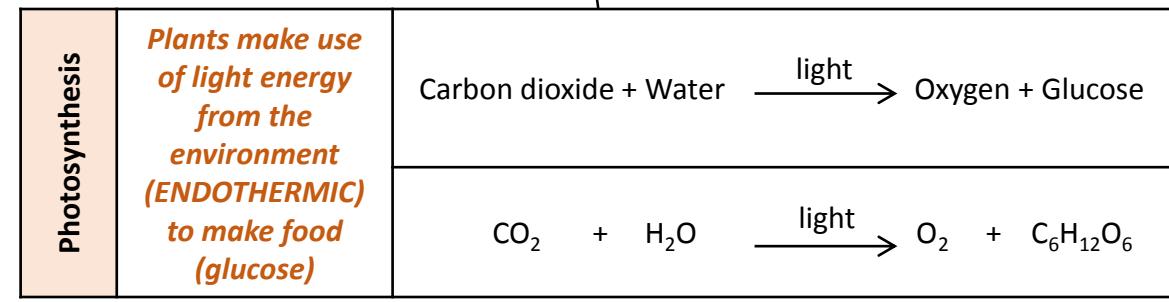
Plants use the glucose produced in photosynthesis in a variety of ways

EDEXCEL GCSE Plant Structures and Functions part 1

Rate of photosynthesis HT Only

Photosynthetic reaction

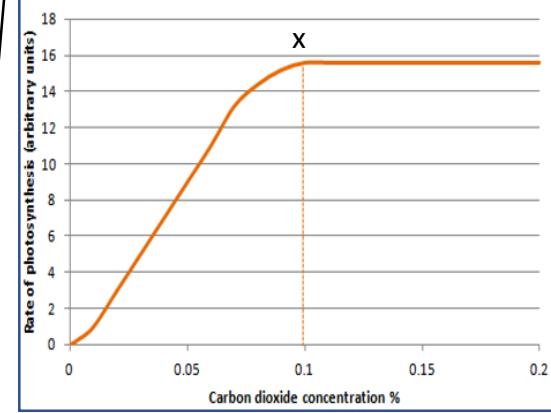
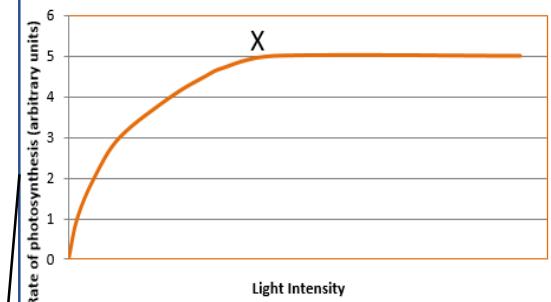
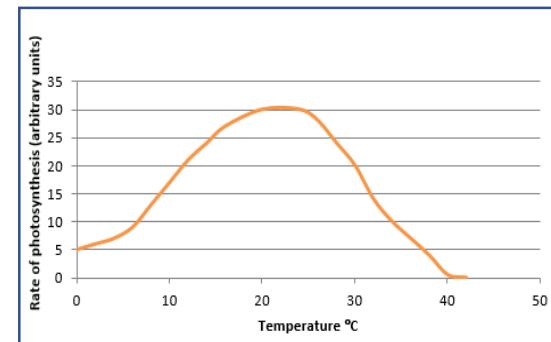
The plant manufactures glucose from carbon dioxide and water using energy transferred from the environment to the chloroplasts by light



The rate of photosynthesis is affected by temperature, light intensity, carbon dioxide concentration.

Factor	How the rate is affected	Limiting factors (why the rate stops going up)
Temperature	As the temperature of the environment the plant is in increases rate of photosynthesis increases (up to a point) as there is more energy for the chemical reaction.	Photosynthesis is an enzyme controlled reaction. If the temperature increases too much, then the enzymes become denatured and the rate of reaction will decrease and stop
Light intensity	Light intensity increases as the distance between the plant and the light sources increases. As light intensity increases so does the rate of photosynthesis (up to a point) as more energy is available for the chemical reaction.	At point X another factor is limiting the rate of photosynthesis. This could be carbon dioxide concentration, temperature or the amount of chlorophyll
Carbon dioxide concentration	Carbon dioxide is needed for plants to make glucose. The rate of photosynthesis will increase when a plant is given higher concentrations of carbon dioxide (up to a point).	At point X another factor is limiting the rate of photosynthesis. This could be light intensity, temperature or the amount of chlorophyll

Rate of photosynthesis



The rate of photosynthesis is proportional to light intensity. Light intensity obeys the inverse square law. This means that if you double the distance between the plant and the light source you quarter the light intensity

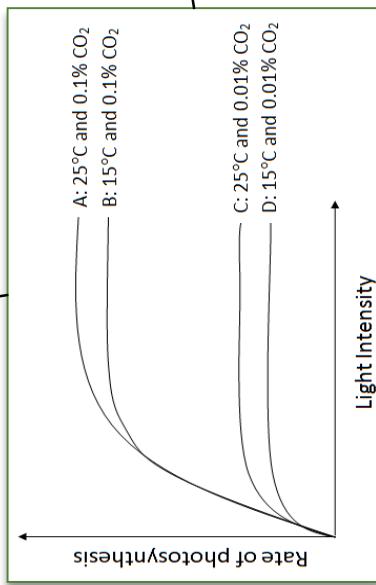
Graph lines C and D: If temperature is increased by 10°C then a slight increase in rate of photosynthesis occurs.

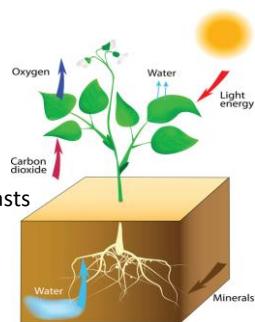
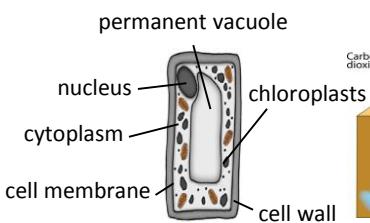
Explain the interactions of temperature, light intensity and carbon dioxide concentration in limiting the rate of photosynthesis.

Graph lines A and D: If carbon dioxide concentration and temperature are increased the rate of photosynthesis increases significantly up to a point.

Graph Lines A and B: If carbon dioxide concentration is increased from 0.01% to 0.1% then a large increase in rate occurs up to a point.

Graph line A: Rate could be limited by temperature and/or amount of chlorophyll. Plant tissue can be damaged when carbon dioxide concentrations exceed 0.1%





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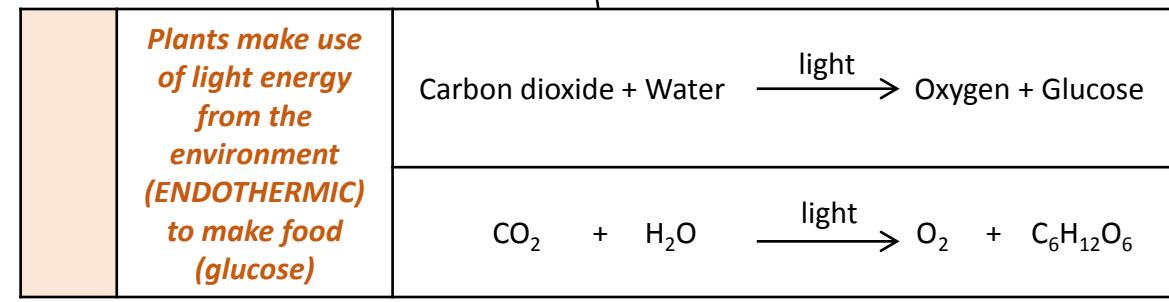
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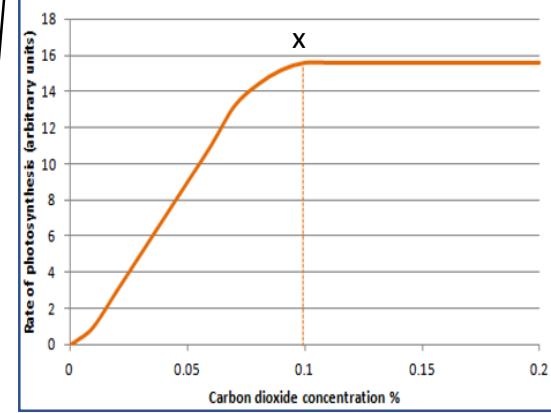
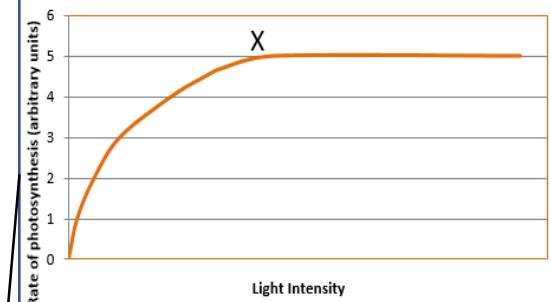
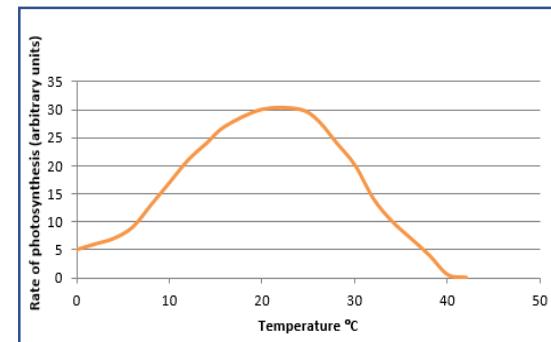
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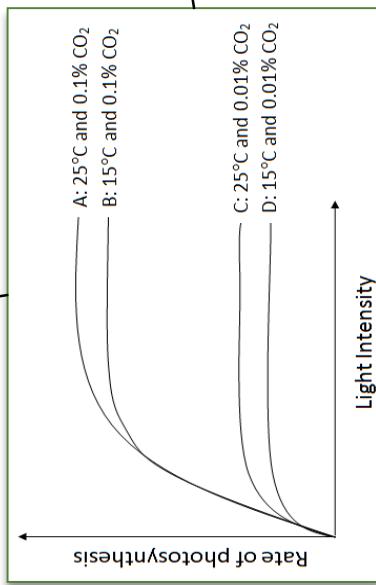
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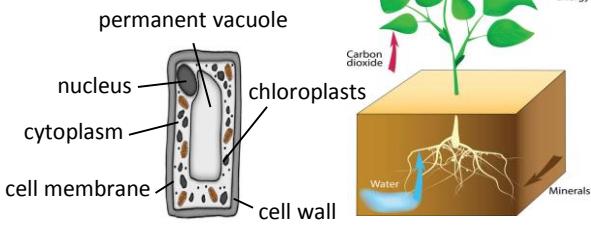
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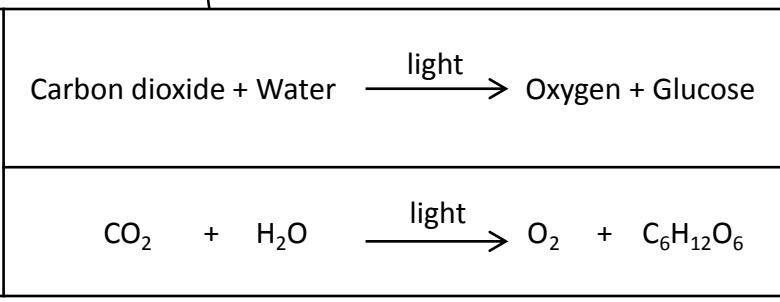
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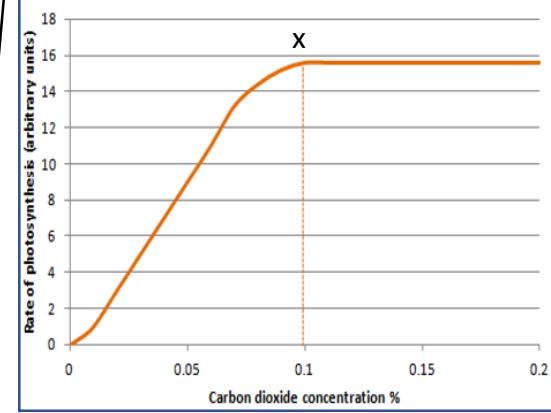
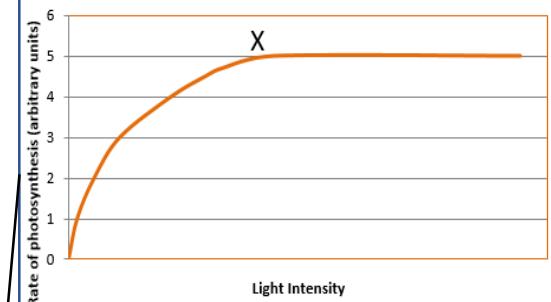
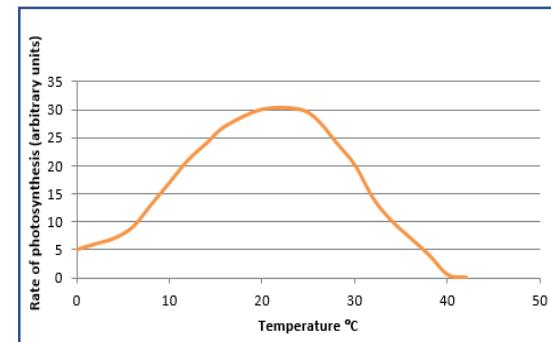
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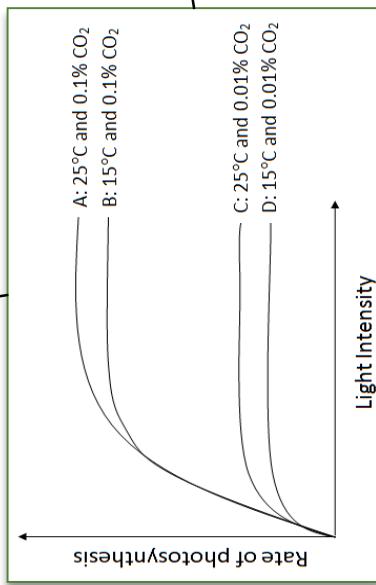
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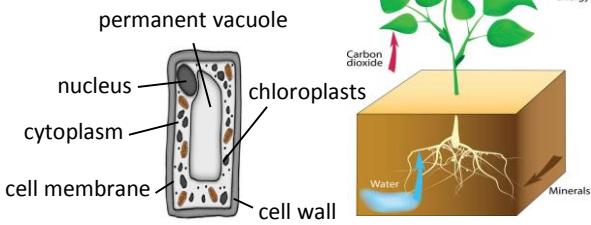
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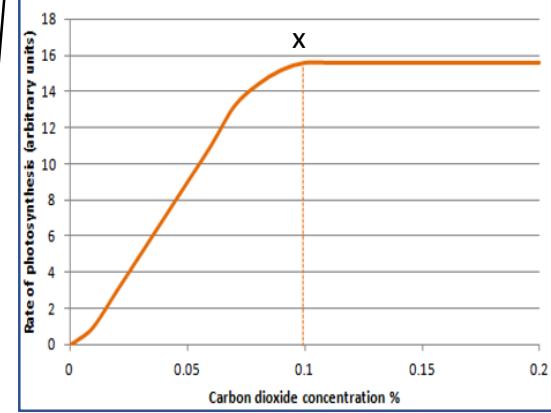
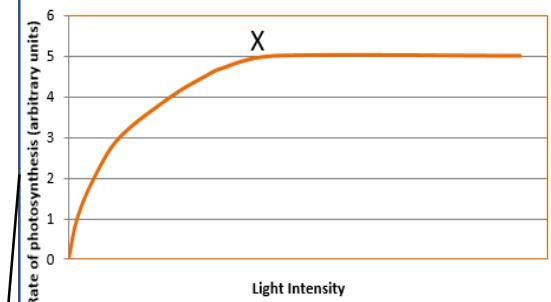
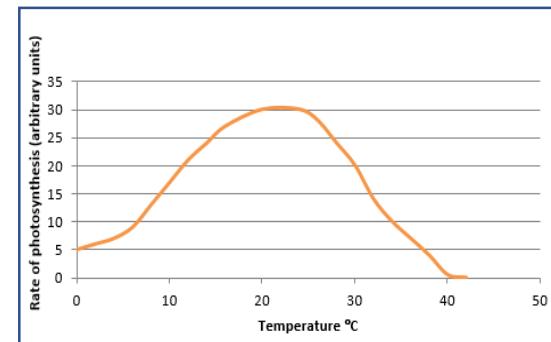
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