

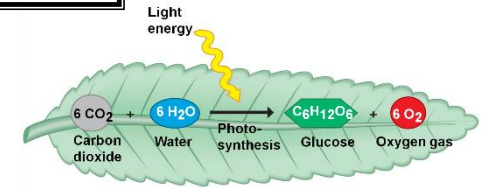
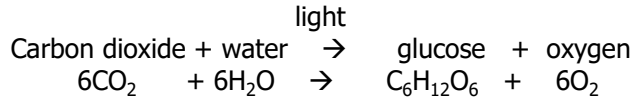


Biology Topic B8 Photosynthesis

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Section 1: Photosynthesis Equation



Section 2: Key terms

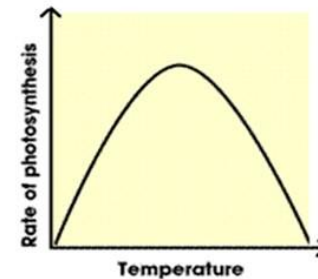
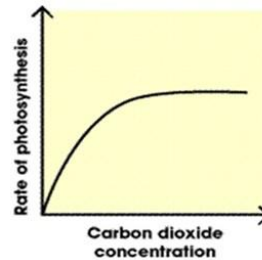
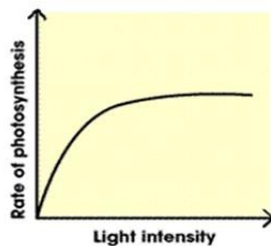
Chloroplast	The plant organelle where photosynthesis takes place.
Chlorophyll	The green pigment that absorbs energy from light .
Endothermic	Photosynthesis takes energy in (in the form of light). It is an endothermic reaction.
Diffusion	The spreading out of particles by random motion from where they are in high concentration to a low concentration. Occurs in gases and liquids.

Section 3: Uses of Glucose

Used in respiration to release energy .
Converted into starch for storage .
Converted into fats and oils for storage .
Produce cellulose to strengthen the cell wall .
Produce amino acids to make proteins (also needs nitrate ions from the soil)

Section 4: Limiting Factors

Limiting Factor	The factor that stops the rate of photosynthesis from increasing; could be light intensity, CO ₂ concentration, temperature or amount of chlorophyll.
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Light Intensity

Initially light is the limiting factor. When the graph plateaus something else (e.g. CO₂ concentration, temperature) is limiting the rate.

CO₂ concentration

Initially CO₂ concentration is the limiting factor. When the graph plateaus something else (e.g. light intensity, temperature) is limiting the rate.

Temperature

As temperature increases, the rate of photosynthesis increases. Above the optimum there is a decrease in photosynthesis. Enzymes needed for photosynthesis become denatured.



Biology Topic B9 Respiration

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Section 5: Respiration

Energy	Energy in organisms is needed for chemical reactions to build larger molecules, movement and keeping warm.
Aerobic Respiration	Aerobic respiration provides energy. It requires oxygen. It is an exothermic reaction (produces heat). In mitochondria. Glucose + oxygen → carbon dioxide + water (+energy) C₆H₁₂O₆ + 6O₂ → 6CO₂ + 6H₂O (+energy)
Anaerobic Respiration (muscles)	No oxygen needed. Provides less energy than aerobic respiration as glucose not fully oxidised. Occurs during intensive exercise. In cytoplasm. Glucose → lactic acid
Lactic Acid	Produced in anaerobic respiration in muscles. Build up of lactic acid causes fatigue. Lactic acid must be taken to the liver by the blood so that it can be oxidised back to glucose.
Oxygen Debt	The amount of extra oxygen the body needs after exercise to react with the lactic acid and remove it.
Anaerobic Respiration (plant and yeast cells)	No oxygen needed. In yeast cells it is called fermentation – economically important for manufacture of bread and alcoholic drinks. In cytoplasm. Glucose → ethanol + carbon dioxide

Section 5: Response to Exercise

Increase in breathing rate	Increases rate at which oxygen is taken into the lungs.
Increase in heart rate	Oxygenated blood is pumped around the body at a faster rate. Carbon dioxide is removed at a faster rate.
Increase in breath volume	A greater volume of oxygen is taken in with each breath.

Section 6a: Metabolism

Metabolism	The sum of all the reactions in a cell or body. Some of these reactions require the energy released from respiration.
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Section 6b: Metabolic Reactions

Conversion of glucose to starch, cellulose or glycogen.
Formation of lipids from glycerol and fatty acids
Use of glucose and nitrates to make amino acids (plants only)
Respiration
Breakdown of proteins to urea

Section 6a: Metabolism in the liver (Higher)

Liver	Detoxifies poisonous substances such as ethanol; passes broken down products in the blood so they can be excreted in the urine via the kidneys; converts lactic acid back into glucose.
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