Bioenergetics

Answers

GCSE science knowledge recall

This topic online

Q	Answer	Remember
1	endothermic	The energy is transferred to the chloroplasts by light.
2	oxygen	Light is written above the arrow because it is the energy source, not a reactant.
3	C6H12O6	Balanced: $6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$.
4	chlorophyll	It is found inside chloroplasts.
5	limiting factor	For photosynthesis it can be temperature, light intensity, carbon dioxide or the amount of chlorophyll.
6	decreases	The enzymes controlling photosynthesis become denatured.
7	oxygen	More bubbles per minute means a faster rate.
8	increases	Distance is the variable you change; light intensity is what it affects.
9	1/4	Inverse square law: light intensity $\propto 1$ / distance^2, so $1 / 2^2 = 1/4$.
10	carbon dioxide	On the rising part light is limiting; on the plateau something else is.
11	The cost of the extra heating may be more than the extra money made from the bigger crop.	Growers balance the extra yield against the cost of heat, light and carbon dioxide.
12	starch	Insoluble means it does not affect osmosis in the cell.
13	cellulose	Glucose also makes fats and oils for storage, and amino acids for protein.
14	nitrate	Amino acids contain nitrogen, which glucose does not.
15	exothermic	It is the opposite of photosynthesis in energy terms.
16	water	It is the photosynthesis equation run backwards.
17	anaerobic respiration	It transfers much less energy than aerobic respiration because glucose is not fully oxidised.
18	lactic acid	Glucose → lactic acid. No carbon dioxide is made in animal cells.
19	fermentation	Yeast makes ethanol and carbon dioxide; the gas makes bread rise.
20	ethanol	Plant cells respire anaerobically in the same way.
21	Any one: to build larger molecules from smaller ones, for movement (muscle contraction), or to keep warm.	Respiration happens all the time in every living cell.

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Q	Answer	Remember
22	increases	Breath volume and heart rate rise too, to deliver more oxygen to the muscles.
23	muscle fatigue	Lactic acid building up is one cause.
24	glycogen	Glycogen is also stored in the liver.
25	oxygen debt	This is why you keep breathing hard after you stop running.
26	liver	The liver needs oxygen to do this, which is the oxygen debt being repaid.
27	metabolism	Respiration supplies the energy for these reactions, which are controlled by enzymes.
28	polysaccharide	Poly = many, saccharide = sugar.
29	fatty acids	Digestion splits lipids back into these same two parts.
30	urea	Urea is made in the liver from excess amino acids and removed by the kidneys.

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