

GCSE Biology Complete Revision Summary

Exchange and transport in Animals

Cell Biology

Organisation

Infection and Response

Bioenergetics

Photosynthesis

Factors affecting photosynthesis

How plants use glucose

Greenhouses

Respiration



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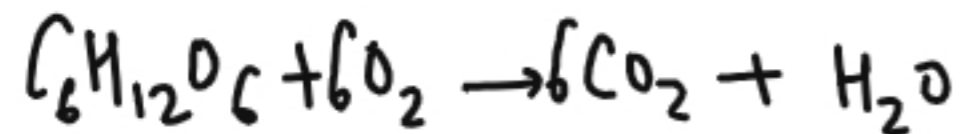
RESPIRATION

It is the process of breaking down food to release energy.

AEROBIC RESPIRATION

- Takes place in the presence of Oxygen
- Releases more energy and the food is completely broken down.
- Takes place in the mitochondria
- It is opposite of photosynthesis

Glucose + Oxygen → Carbon Dioxide + Water

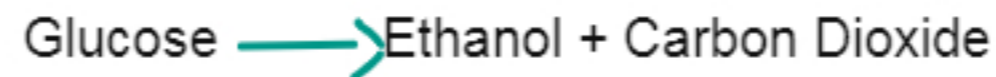


ANAEROBIC RESPIRATION

- Takes place in absence of oxygen.
- Releases less energy and food is not completely broken down.
- Takes place in the Cytoplasm

PLANTS

known as fermentation
forms ethanol and carbon-dioxide



ANIMALS

takes place in muscles



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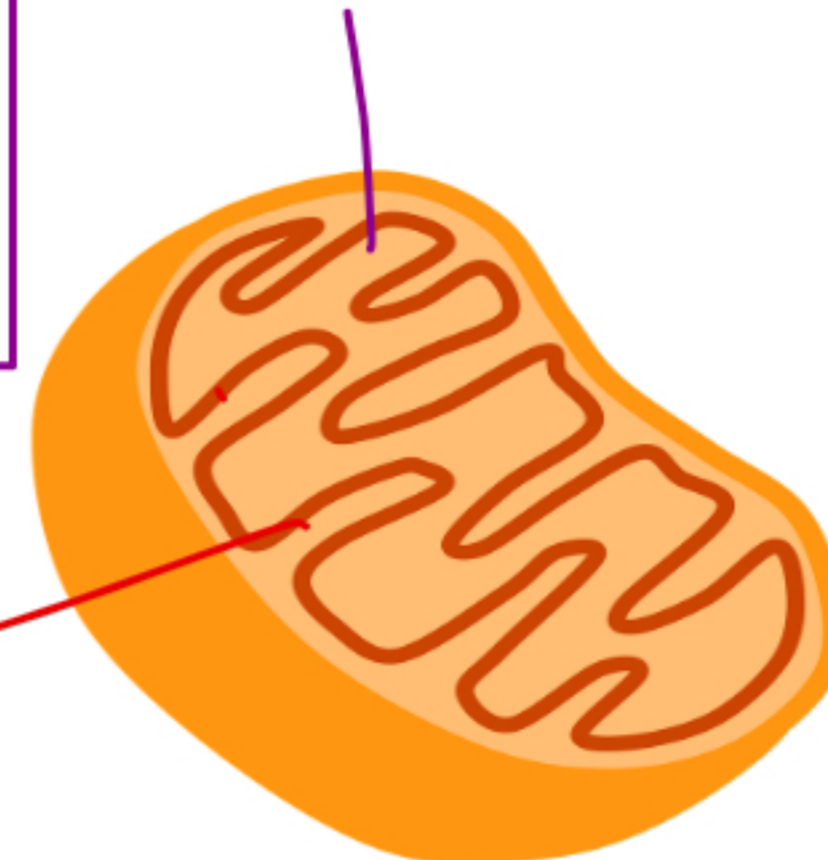
BREATHING AND RESPIRATION

BREATHING	RESPIRATION
It is a physical process.	It is chemical process.
Does not involve enzymes	Involve Enzymes
It is breathing in oxygen and breathing out carbon dioxide	It is breaking of food in presence of oxygen for energy.
No energy is released	Energy is released
Takes place outside the cells	Takes place inside the cells

EXOTHERMIC
As it releases heat.

The energy released in making carbon dioxide and water is more than the energy taken in to break glucose and oxygen.

Cristae





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WHY WE NEED ENERGY

MOVEMENT

Energy is required by the muscles to contract.

Respiration provides energy for muscle contraction.

Muscle cells have loads of mitochondria and glycogen for efficient respiration.

TRANSPORT

Transport of substance in an out of the cell against the concentration gradient via active transport required energy.

THERMOREGULATION

Respiration produces heat which helps to maintain the body temperature.

CATABOLISM

Breaking of large substances to smaller ones like digestion requires energy.

ANABOLISM

Building of bigger molecules from smaller ones like making proteins fats and lipids from minerals ions require energy.

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BREATHING RATE

The breathing rate increases so that more oxygen is inhaled to meet the demands of oxygen by the muscles.

Increased breathing rates also increases the rate of removal of carbon dioxide.

HEART RATE

Increase heart rate pumps more blood to the muscles.

Increase blood supply increases the supply of both glucose and oxygen via blood to the muscles cells.

RESPONSE TO EXERCISE



Demand for oxygen and glucose increases as more energy is needed



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GLYCOGENOLYSIS



Stored carbohydrates, glycogen is converted to glucose in the muscles during exercise to meet the demand for increased glucose.

WHY BREATHING RATE IS HIGH AFTER STOPPING THE EXERCISE

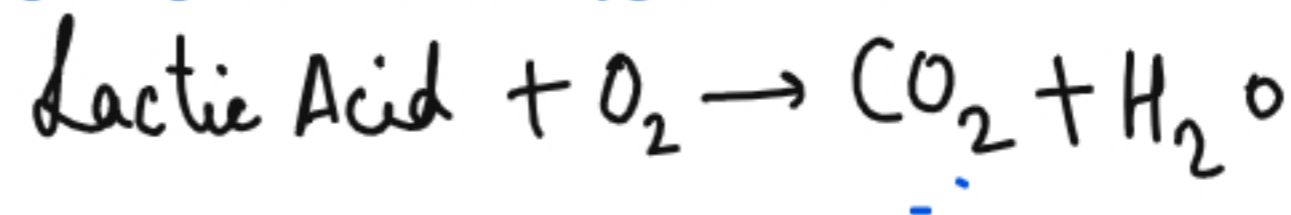
OXYGEN DEBT

Extra Oxygen needed by the body after exercise to recover.

During Exercise the body switches to anaerobic respiration. So glucose is broken down into lactic Acid.



The lactic acid needs to be broken down into carbon dioxide. The breathing rate is still high to get maximum oxygen to break lactic acid.





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METABOLISM

It is the sum of all the reactions of the body

CATABOLISM

breakdown reaction in which bigger molecule is broken down into smaller ones.

- a) Breakdown of glycogen
- b) Breakdown of proteins
- c) Breakdown of lipids
- d) Respiration

ANABOLISM

It is the synthesis reaction in which bigger molecule is formed from the smaller ones.

- a) Synthesis of cellulose from glucose
- b) Synthesis of starch and glycogen from glucose
- c) Synthesis of fats and lipids
- d) Synthesis of proteins

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LIVER

DETOXIFICATION

The alcohol or any poisonous substance taken in the body is detoxified in the liver as liver contains enzymes for detoxification

BREAKDOWN OF BLOOD CELLS

Old and worn out blood cells are broken down in liver.

BREAK DOWN OF LACTIC ACID

Lactic acid produced during anaerobic respiration in the muscles is transported into the liver via blood and liver converts it into carbon dioxide and water by taking in more oxygen which is inhaled as oxygen debt.

BREAKDOWN OF HARMFUL SUBSTANCES FOR EXCRETION

Excess proteins is broken down into urea in the liver which is excreted by kidney as Urine

PHOTOSYNTHESIS VERSUS RESPIRATION

PHOTOSYNTHESIS	RESPIRATION
Only in plant cells	Occurs in all living cells
It is endothermic reaction	It is exothermic reaction.
Oxygen is produced	Oxygen is used up
Takes place in chloroplast	Takes place in Mitochondria
Anabolic reaction, glucose is made	Catabolic reaction, glucose is broken down.
Light dependent	Light independent



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Photosynthesis — It is the process by which green plants prepare their own food. carbon dioxide and water are combined to form glucose and oxygen in presence of sunlight

Respiration — breakdown of food to release energy.

Limiting Factors — Factor that limits the rate of photosynthesis

Endothermic Reaction — Reaction that takes in heat

Exothermic Reaction — Reaction that releases heat

Glucose — product of photosynthesis and fuel for respiration

Starch — Storage carbohydrate in plants

Glycogen — Storage carbohydrate in animals

Aerobic Respiration — Breaking down of food in presence of oxygen.

KEY TERMS

Anaerobic Respiration — breaking down of food in absence of oxygen

Fermentation — Anaerobic respiration in plants that produces ethanol and carbon dioxide

Greenhouse — A glass or a plastic house to control the limiting factors and increase the rate of photosynthesis.

Metabolism — Sum of all the catabolic and anabolic reactions of the body.

Liver — An organ involved in metabolism.

Lactic Acid — The product of anaerobic respiration in animals

Oxygen Debt — The extra oxygen needed after exercise to break down lactic acid and recover to pre exercise state.

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NEXT STEP !!!!



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