

WJEC England Biology GCSE

1.3 - Cell metabolism

Flashcards



What are enzymes?



What are enzymes?

Enzymes are biological catalysts that speed up the rate of metabolic reactions



Describe the structure of enzymes



Describe the structure of enzymes

Enzymes are proteins that contain an active site that fits a specific substrate



Describe the lock and key hypothesis



Describe the lock and key hypothesis

A substrate that fits the specific active site of the enzyme binds, a reaction occurs (catalysed by the enzyme) and then the products are released.



State 4 factors that affect enzyme function



State 4 factors that affect enzyme function

- Temperature
- pH
- Substrate concentration
- Enzyme concentration

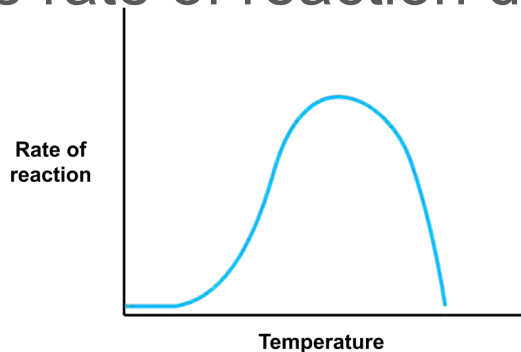


Describe the effect of temperature on the rate of an enzyme-controlled reaction



Describe the effect of temperature on the rate of an enzyme-controlled reaction

- As the temperature increases, so does the rate of reaction
- Once the temperature exceeds the optimum, the enzyme denatures and the rate of reaction decreases



If temperature increases above the optimum, how does this affect enzyme function?



If temperature increases above the optimum, how does this affect enzyme function?

The active site will be distorted as the enzyme denatures and so it will no longer fit the substrate

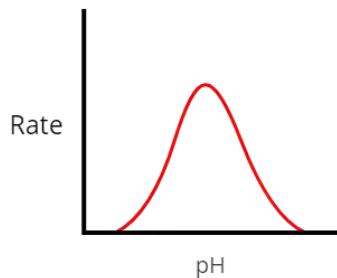


Describe the effect of pH on the rate of an enzyme-controlled reaction



Describe the effect of pH on the rate of an enzyme-controlled reaction

- The rate of an enzyme catalysed reaction is fastest at the optimum pH
- If the pH is too high or low, the enzyme will work less efficiently and the active site may be denatured at extremes of pH



What is the purpose of respiration?



What is the purpose of respiration?

To produce energy in the form of ATP
from larger molecules (like sugars)



What type of reaction is respiration?



What type of reaction is respiration?

Respiration is an exothermic reaction



When does aerobic respiration take place?



When does aerobic respiration take place?

When there is plenty of oxygen available



Where does aerobic respiration take place?



Where does aerobic respiration take place?

In the cytoplasm and mitochondria



What is the word equation for aerobic respiration?



What is the word equation for aerobic respiration?

Glucose + Oxygen → Carbon dioxide + Water (+ energy)



What is the symbol equation for aerobic respiration?



What is the symbol equation for aerobic respiration?



When does anaerobic respiration take place?



When does anaerobic respiration take place?

When there is little or no oxygen available



Where does anaerobic respiration take place?



Where does anaerobic respiration take place?

In the cytoplasm



What does anaerobic respiration in animals produce?



What does anaerobic respiration in animals produce?

Lactic acid and energy



What does anaerobic respiration in yeast produce?



What does anaerobic respiration in yeast produce?

Ethanol (alcohol), carbon dioxide and energy



Which type of respiration produces more
ATP?



Which type of respiration produces more ATP?

Aerobic respiration which produces 36 ATP compared to anaerobic respiration which produces only 2 ATP as it is the incomplete breakdown of glucose



What is the oxygen debt?



What is the oxygen debt?

The extra oxygen that is needed to break down the lactic acid formed in anaerobic respiration



What type of molecules are carbohydrates and proteins?



What type of molecules are carbohydrates and proteins?

They are polymers



What are the monomers that make up proteins?



What are the monomers that make up proteins?

Amino acids



What type of enzymes break down carbohydrates?



What type of enzymes break down carbohydrates?

Carbohydrases



What type of enzymes break down proteins?



What type of enzymes break down proteins?

Proteases



What type of enzymes break down lipids and what are they broken down into?



What type of enzymes break down lipids and what are they broken down into?

Lipids are broken down by lipases into glycerol and fatty acids



What is the function of carbohydrates in the diet?



What is the function of carbohydrates in the diet?

Carbohydrates are the body's main source of energy



What are the functions of proteins in the body?



What are the functions of proteins in the body?

Proteins can have structural or metabolic roles in the body and are used as hormones, enzymes, antibodies, etc.



What is the function of lipids in the body?



What is the function of lipids in the body?

- Energy storage
- Cell membranes
- Buoyancy
- Insulation

