

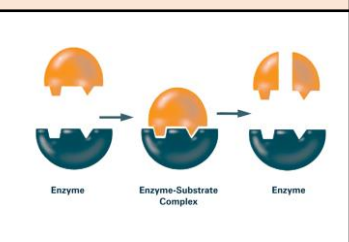
Enzymes catalyse (increase the rate of) specific reactions in living organisms.

The rate of a reaction can be measured by how fast reactants are used up or by how fast products are formed.

The activity of enzymes is affected by changes in temperature, pH and substrate concentration

<p><i>Enzymes activity has an optimum temperature</i></p>	<p><i>Enzyme activity has an optimum pH</i></p>	<p><i>Increasing substrate concentration increases rate (limited by number of active sites)</i></p>
---	---	---

The 'lock and key theory' is a simplified model to explain enzyme action



Enzymes catalyse specific reactions in living organisms due to the shape of their active site.

Enzymes

Edexcel GCSE Biology Key Concepts Part 2

Digestive enzymes speed up the conversion of large insoluble molecules (food) into small soluble molecules that can be absorbed into the bloodstream.

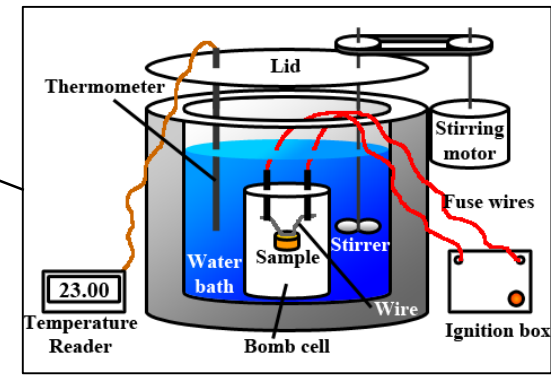
Large changes in temperature or pH can stop the enzyme from working (denature).

<i>Temperature too high</i>	<i>pH too high or too low</i>
-----------------------------	-------------------------------

Enzyme changes shape (denatures) the substrate no longer fits the active site.

Calorimetry

The energy in food can be calculated by how much it heats up water when it burns in a calorimeter.



Calculate percentage gain/loss of mass in osmosis.

$$\% \text{ change in mass} = \frac{(\text{final mass} - \text{initial mass})}{\text{initial mass}} \times 100$$

The greater the difference in concentrations the faster the rate of diffusion.

Osmosis

Transport in cells

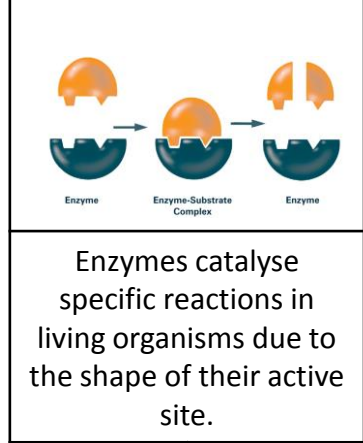
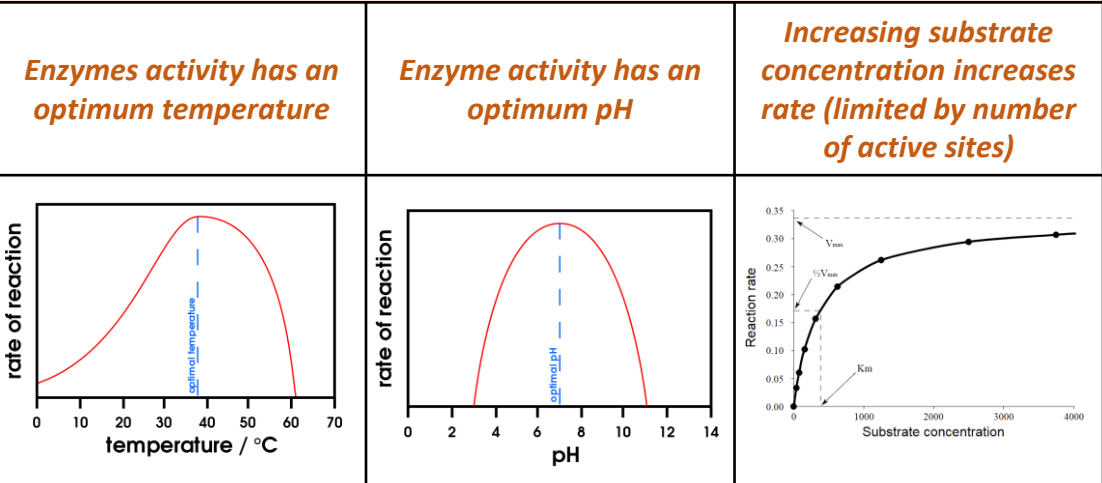
Carbohydrases (e.g. amylase)		<i>Made in salivary glands, pancreas, small intestine</i>	Break down carbohydrates to simple sugar (e.g. amylase breaks down starch to glucose).
Proteases		<i>Made in stomach, pancreas</i>	Break down protein to amino acids.
Lipases		<i>Made in pancreas (works in small intestine)</i>	Break down lipids (fats) to glycerol and fatty acids.

The products of digestion are used to build new carbohydrates, lipids and proteins. Some glucose is used for respiration.

Diffusion <i>No</i> energy required	<i>Movement of particles in a solution or gas from a higher to a lower concentration</i>	E.g. O ₂ and CO ₂ in gas exchange, urea in kidneys. Factors that affect the rate are concentration, temperature and surface area.
Osmosis <i>No</i> energy required	<i>Movement of water from a dilute solution to a more concentrated solution</i>	E.g. Plants absorb water from the soil by osmosis through their root hair cells. Plants use water for several vital processes including photosynthesis and transporting minerals.
Active transport <i>ENERGY</i> required	<i>Movement of particles from a dilute solution to a more concentrated solution</i>	E.g. movement of mineral ions into roots of plants and the movement of glucose into the small intestines.

Enzymes catalyse (increase the rate of) specific reactions in living organisms.

The rate of a reaction can be measured by how fast reactants are used up or by how fast products are formed.



Digestive enzymes speed up the conversion of large insoluble molecules (food) into small soluble molecules that can be absorbed into the bloodstream.

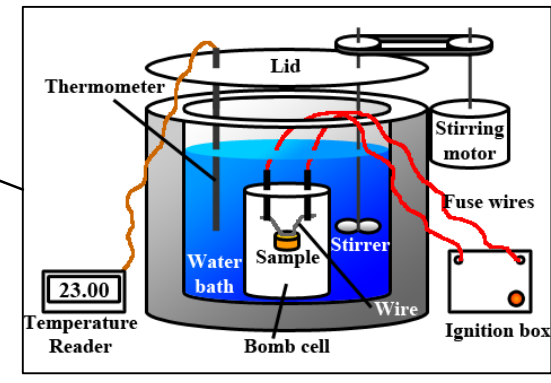
<i>Temperature too high</i>	<i>pH too high or too low</i>
Enzyme changes shape (denatures) the substrate no longer fits the active site.	

Enzymes
Edexcel GCSE Biology Key Concepts Part 2

Calorimetry
Osmosis

Calculate percentage gain/loss of mass in osmosis.

The energy in food can be calculated by how much it heats up water when it burns in a calorimeter.



$$\% \text{ change in mass} = \frac{(\text{final mass} - \text{initial mass})}{\text{initial mass}} \times 100$$

The greater the difference in concentrations the faster the rate of diffusion.

Transport in cells

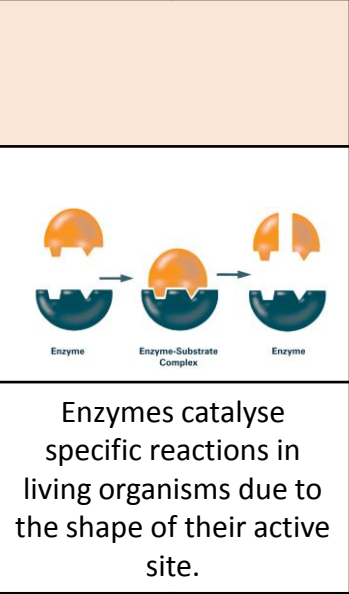
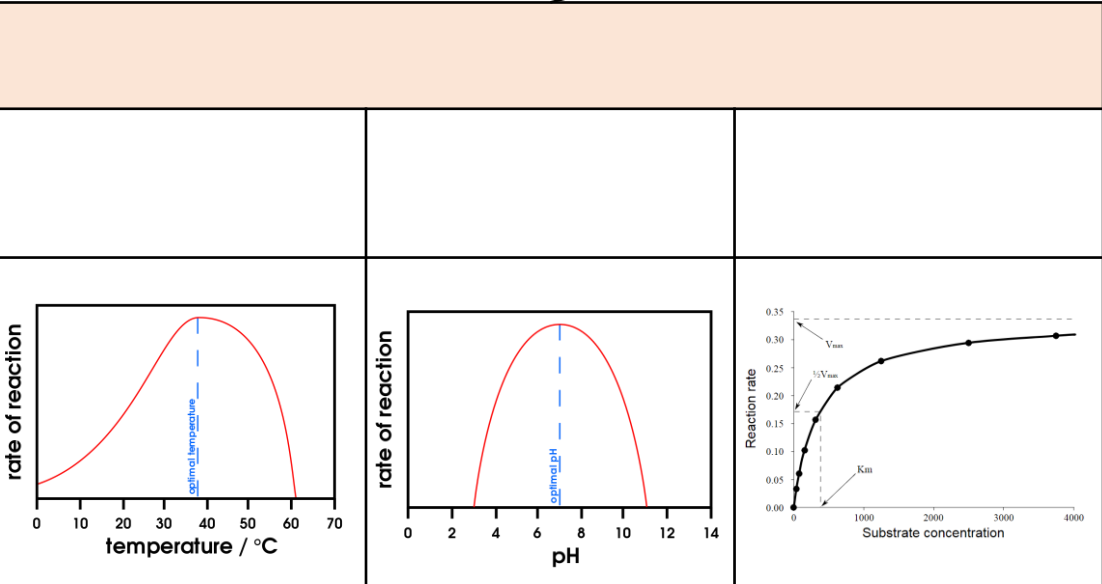
	<p>Made in salivary glands, pancreas, small intestine</p> <p>Break down carbohydrates to simple sugar (e.g. amylase breaks down starch to glucose).</p>
	<p>Made in stomach, pancreas</p> <p>Break down protein to amino acids.</p>
	<p>Made in pancreas (works in small intestine)</p> <p>Break down lipids (fats) to glycerol and fatty acids.</p>

The products of digestion are used to build new carbohydrates, lipids and proteins. Some glucose is used for respiration.

<p>Movement of particles in a solution or gas from a higher to a lower concentration</p>	<p>E.g. O₂ and CO₂ in gas exchange, urea in kidneys. Factors that affect the rate are concentration, temperature and surface area.</p>
<p>Movement of water from a dilute solution to a more concentrated solution</p>	<p>E.g. Plants absorb water from the soil by osmosis through their root hair cells. Plants use water for several vital processes including photosynthesis and transporting minerals.</p>
<p>Movement of particles from a dilute solution to a more concentrated solution</p>	<p>E.g. movement of mineral ions into roots of plants and the movement of glucose into the small intestines.</p>

Enzymes catalyse (increase the rate of) specific reactions in living organisms.

The rate of a reaction can be measured by how fast reactants are used up or by how fast products are formed.



Enzymes
Edexcel GCSE Biology Key Concepts Part 2

Digestive enzymes speed up the conversion of large insoluble molecules (food) into small soluble molecules that can be absorbed into the bloodstream.

Enzyme changes shape (denatures) the substrate no longer fits the active site.

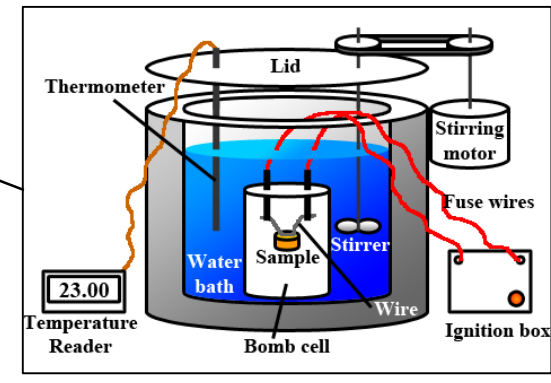
	Break down carbohydrates to simple sugar (e.g. amylase breaks down starch to glucose).
	Break down protein to amino acids.
	Break down lipids (fats) to glycerol and fatty acids.

The products of digestion are used to build new carbohydrates, lipids and proteins. Some glucose is used for respiration.

Calorimetry
Osmosis

Calculate percentage gain/loss of mass in osmosis.

The energy in food can be calculated by how much it heats up water when it burns in a calorimeter.



$$\% \text{ change in mass} = \frac{(\text{final mass} - \text{initial mass})}{\text{initial mass}} \times 100$$

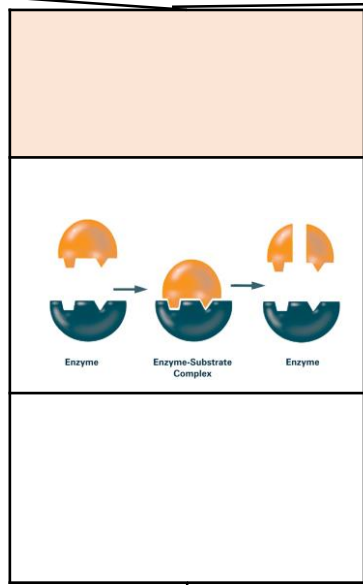
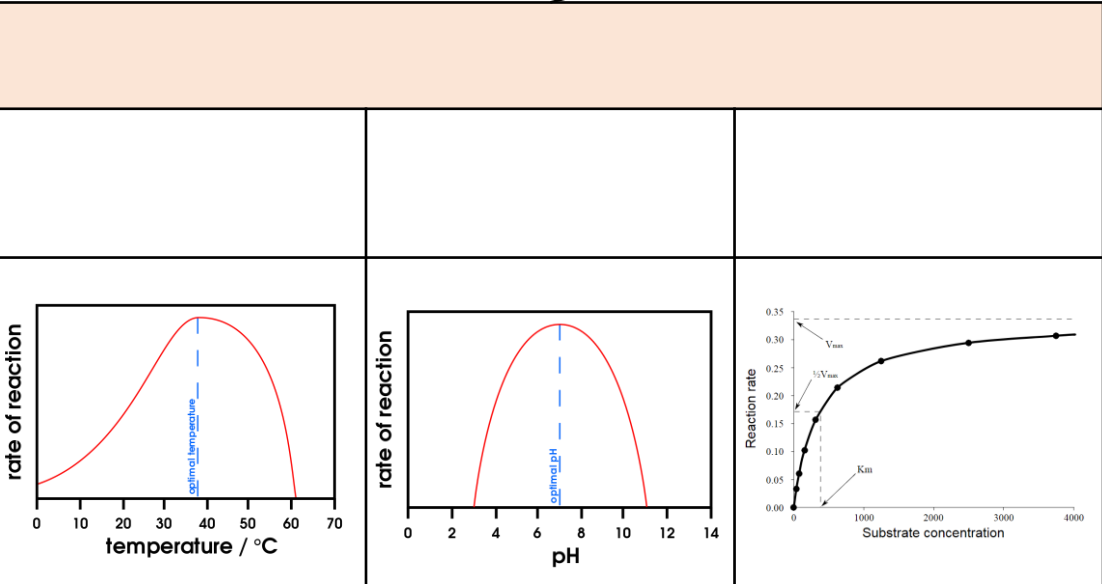
The greater the difference in concentrations the faster the rate of diffusion.

Transport in cells

	E.g. O ₂ and CO ₂ in gas exchange, urea in kidneys. Factors that affect the rate are concentration, temperature and surface area.
	E.g. Plants absorb water from the soil by osmosis through their root hair cells. Plants use water for several vital processes including photosynthesis and transporting minerals.
	E.g. movement of mineral ions into roots of plants and the movement of glucose into the small intestines.

Enzymes catalyse (increase the rate of) specific reactions in living organisms.

The rate of a reaction can be measured by how fast reactants are used up or by how fast products are formed.



Digestive enzymes speed up the conversion of large insoluble molecules (food) into small soluble molecules that can be absorbed into the bloodstream.

Enzymes
Edexcel GCSE Biology Key Concepts Part 2

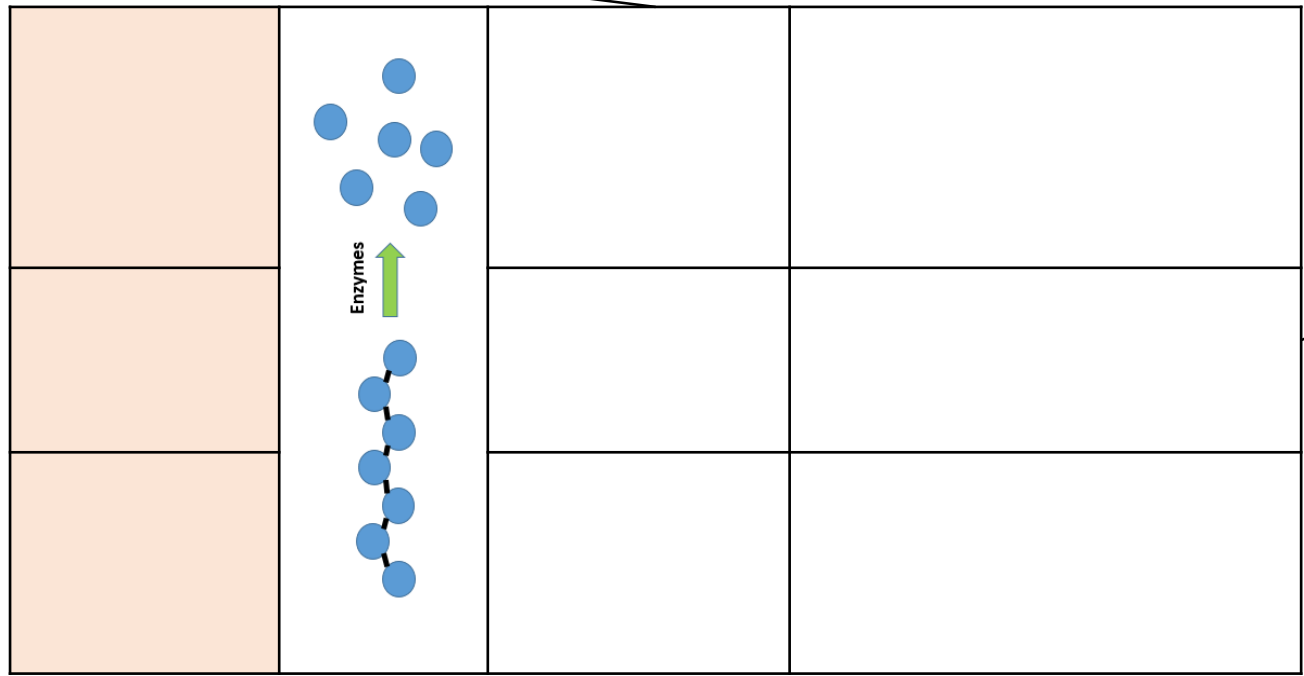
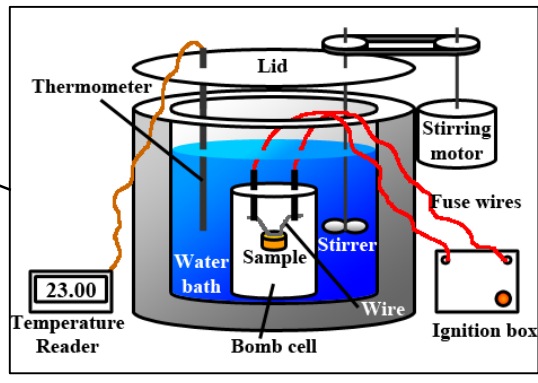
Calorimetry
Osmosis

Calculate percentage gain/loss of mass in osmosis.

$$\% \text{ change in mass} = \frac{(\text{final mass} - \text{initial mass})}{\text{initial mass}} \times 100$$

The greater the difference in concentrations the faster the rate of diffusion.

The energy in food can be calculated by how much it heats up water when it burns in a calorimeter.



The products of digestion are used to build new carbohydrates, lipids and proteins. Some glucose is used for respiration.

Transport in cells
