

B9 Respiration

Lessons TBAT	Key Knowledge	Practical	Assessment
<p>TBAT: Explain why aerobic respiration is so important</p> <p>TBAT: Describe how the body responds during exercise</p> <p>TBAT: Compare aerobic and anaerobic respiration</p>	<p>Students should be able to describe cellular respiration as an exothermic reaction which is continuously occurring in living cells. The energy transferred supplies all the energy needed for living processes. Respiration in cells can take place aerobically (using oxygen) or anaerobically (without oxygen), to transfer energy.</p> <p>Students should be able to compare the processes of aerobic and anaerobic respiration with regard to the need for oxygen, the differing products and the relative amounts of energy transferred.</p> <p>Organisms need energy for: • chemical reactions to build larger molecules • movement • keeping warm. Aerobic respiration is represented by the equation: glucose + oxygen carbon dioxide + water Students should recognise the chemical symbols: C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>, O<sub>2</sub>, CO<sub>2</sub> and H<sub>2</sub>O. Anaerobic respiration in muscles is represented by the equation: glucose lactic acid As the oxidation of glucose is incomplete in anaerobic respiration much less energy is transferred than in aerobic respiration. Anaerobic respiration in plant and yeast cells is represented by the equation: glucose ethanol +</p>	<p>Investigations into the effect of exercise on the body.</p>	<p>Assessment on B8 and B9 combines</p> <hr/> <p>Maths focus</p>

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<p>TBAT: Explain the role of the liver in metabolism</p>	<p>carbon dioxide Anaerobic respiration in yeast cells is called fermentation and has economic importance in the manufacture of bread and alcoholic drinks.</p> <p>During exercise the human body reacts to the increased demand for energy. The heart rate, breathing rate and breath volume increase during exercise to supply the muscles with more oxygenated blood. If insufficient oxygen is supplied anaerobic respiration takes place in muscles. The incomplete oxidation of glucose causes a build up of lactic acid and creates an oxygen debt. During long periods of vigorous activity muscles become fatigued and stop contracting efficiently.</p> <p>Students should be able to explain the importance of sugars, amino acids, fatty acids and glycerol in the synthesis and breakdown of carbohydrates, proteins and lipids. Metabolism is the sum of all the reactions in a cell or the body. The energy transferred by respiration in cells is used by the organism for the continual enzyme controlled processes of metabolism that synthesise new molecules. Metabolism includes:</p> <ul style="list-style-type: none"><li>• conversion of glucose to starch, glycogen and cellulose</li><li>• the formation of lipid molecules from a molecule of glycerol and three molecules of fatty acids</li><li>• the use of glucose and nitrate ions to form amino acids which in turn are used to synthesise proteins</li><li>• respiration</li><li>• breakdown of excess proteins to form urea for excretion.</li></ul> <p>All of these aspects are covered in more detail in the relevant specification section but are linked together here.</p>	<p>Key stage 3</p> <p>Cellular respiration ♣ aerobic and anaerobic respiration in living organisms, including the breakdown of organic molecules to enable all the other chemical processes necessary for life ♣ a word summary for aerobic respiration ♣ the process of anaerobic respiration in humans and micro-organisms, including fermentation, and a word summary for anaerobic respiration ♣ the differences between aerobic and anaerobic respiration in terms of the reactants, the products formed and the implications for the organism.</p>
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