

B3 Organisation and the Digestive System

Lessons TBAT	Key Knowledge	Practical	Assessment
<p>TBAT: Describe the relationship between cells, tissues and organs</p>	<p>Cells are the basic building blocks of all living organisms. A tissue is a group of cells with a similar structure and function. Organs are aggregations of tissues performing specific functions. Organs are organised into organ systems, which work together to form organisms.</p>	<p>Required practical activity 3: use qualitative reagents to test for a range of carbohydrates, lipids and proteins. To include: Benedict's test for sugars; iodine test for starch; and Biuret reagent for protein.</p>	
<p>TBAT: Explain the roles of the digestive organs</p>	<p>This section assumes knowledge of the digestive system studied in Key Stage 3 science. The digestive system is an example of an organ system in which several organs work together to digest and absorb food. Students should be able to relate knowledge of enzymes to Metabolism (page 42). Students should be able to describe the nature of enzyme molecules and relate their activity to temperature and pH changes. Students should be able to carry out rate calculations for chemical reactions. Enzymes catalyse specific reactions in living organisms due to the shape of their active site.</p>	<p>Required practical activity 4: investigate the effect of pH on the rate of reaction of amylase enzyme. Students should use a continuous sampling technique to determine the time taken to completely digest a starch solution at a range of pH values. Iodine reagent is to be used to test for starch every 30 seconds. Temperature must be controlled by use of a water bath or electric heater</p>	
<p>TBAT Test for different nutrients</p>			
<p>TBAT : Describe and explain the role of enzymes in digestion</p>	<p>Students should be able to use the 'lock and key theory' as a simplified model to explain enzyme action. Students should be able to recall the sites of production and the action of amylase, proteases and lipases. Students should be able to understand simple word equations but no chemical symbol equations are</p>		
<p>TBAT: Explain why certain factors</p>			
			<p>Maths focus Students should be able to use simple compound measures such as rate and carry out rate calculations for blood flow Students should be able to carry out rate calculations for chemical reactions.</p>

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<p>effect enzyme activity</p> <p>TBAT: Describe how the pH of the digestive system works</p> <p>TBAT: Describe the role of stomach acid and bile in digestion</p>	<p>required. Digestive enzymes convert food into small soluble molecules that can be absorbed into the bloodstream.</p> <p>Carbohydrases break down carbohydrates to simple sugars. Amylase is a carbohydrase which breaks down starch. Proteases break down proteins to amino acids. Lipases 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 in respiration. Bile is made in the liver and stored in the gall bladder. It is alkaline to neutralise hydrochloric acid from the stomach. It also emulsifies fat to form small droplets which increases the surface area. The alkaline conditions and large surface area increase the rate of fat breakdown by lipase.</p>	<p>Key stage 3</p> <ul style="list-style-type: none"> ♣ content of a healthy human diet: carbohydrates, lipids (fats and oils), proteins, vitamins, minerals, dietary fibre and water, and why each is needed ♣ calculations of energy requirements in a healthy daily diet ♣ the consequences of imbalances in the diet, including obesity, starvation and deficiency diseases ♣ the tissues and organs of the human digestive system, including adaptations to function and how the digestive system digests food (enzymes simply as biological catalysts) <p>Science – key stage 3 6</p> <ul style="list-style-type: none"> ♣ the importance of bacteria in the human digestive system ♣ plants making carbohydrates in their leaves by photosynthesis and gaining mineral nutrients and water from the soil via their roots.
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