

Topic 1: Body systems

What's the science story?

The human body is a complex and astounding thing. It allows us to be the most sophisticated organism on the planet. During this scheme of work, you will concentrate on some specific areas of our body that allow us to do the things we can do, and how at times we hamper that through the choices we make.



Previous knowledge:

- recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function
- describe the ways in which nutrients and water are transported within animals, including humans.
- describe the simple functions of the basic parts of the digestive system in humans
- describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

Next steps...

KS4 links:
Biology Paper 1—Organisation



Keywords

Bone, Cartilage, Skeleton, Antagonistic, Tendon, Skin Muscle, Nutrients, Healthy, Balanced, Deficiency Drugs, Medicinal, Recreational, Illegal, Legal, Biurets, Benedict's, Iodine, Digestion, Breakdown, Enzyme Function, Breathing, Inhalation, Exhalation, Ventilation, Lungs, Bronchi, Bronchioles, Diaphragm, Ribs, Alveoli, Oxygen, Carbon dioxide, Intercostal muscles, Smoking, Lungs, Nicotine, Toxins, Chemicals



Lesson No. and Title	Learning objectives – Knowledge	National Curriculum	Working scientifically skills	Practical equipment
1. What is healthy?	<p>ARE -To calculate the energy requirements in a healthy diet.</p> <p>AGD - To explore the consequences of an imbalanced diet.</p>	<ul style="list-style-type: none"> the 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 		PRAC: Food labels—range of similar products to compare info.
2. How do drugs affect our behaviour?	<p>ARE - To explain the effects of recreational drugs on behaviour and health.</p> <p>AGD - To compare the effects of a range of drugs on life processes.</p>	<ul style="list-style-type: none"> the effects of recreational drugs (including substance misuse) on behaviour, health and life processes 		
3. What is in our food? (2x lessons)	<p>ARE - To describe the method for testing the different nutrients in food.</p> <p>AGD - To compare the nutritional contain of a range of foods.</p>	<ul style="list-style-type: none"> the 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 		<p>DEMO: Positive results for starch, protein, glucose and fats.</p> <p>PRAC: Food tests: 5 different (range) types of food, spotting tiles, pipettes, 100ml beakers, kettle, iodine, biuret sol, benedict's sol, ethanol, distilled water , filter paper, funnel, testtubes</p>
Assessment 1: Diet				

5. The digestive system	<p>ARE - To explain the purpose of enzymes in digestion.</p> <p>AGD - To explain the importance of the digestive system and the consequences of when it doesn't work properly.</p>	<ul style="list-style-type: none"> 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) the importance of bacteria in the human digestive system 		<p>DEMO: Making poo</p> <p>Food processor, tights—cut at both ends, cereal, milk, sandwich (made), pasta, coffee, crisps, banana, 3 different food colourings.</p>
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Assessment 2: Digestive system

6. How do our lungs work?	<p>ARE - To describe how the bell jar model can be used to demonstrate ventilation.</p> <p>AGD - To interpret data given to explain the difference in the composition of inhaled and exhaled air</p>	<ul style="list-style-type: none"> the mechanism of breathing to move air in and out of the lungs, using a pressure model to explain the movement of gases, including simple measurements of lung volume 		<p>DEMO: Bell jar—lung model</p> <p>PRAC: Model lungs</p> <p>Clean, clear plastic bottle, balloon, Sellotape, straws, strong plastic food bag, (optional—sand paper)</p>
7. Gas exchange	<p>ARE - To describe how gases are exchanged in the lungs.</p> <p>AGD - To explain how the alveoli are adapted to their function.</p>	<ul style="list-style-type: none"> the structure and functions of the gas exchange system in humans, including adaptations to function 		<p>DEMO: Lung dissection</p> <p>Pluck, tweezers, scalpel, white tile, tray, bin bag, trough of water</p>

Assessment 3: Gas exchange

8. Asthma and smoking	<p>ARE - To describe what happens during an asthma attack.</p> <p>AGD - To justify the importance of a healthy lifestyle.</p>	<ul style="list-style-type: none">• the impact of exercise, asthma and smoking on the human gas exchange system• the effects of recreational drugs (including substance misuse) on behaviour, health and life processes		
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Assessment Criteria

Assessment No. & Title	AO1 - Working Towards	AO2 - Age Related Expectations	AO3 - At Greater Depth
1. Diet	Name some nutrients needed by the human body.	Explain the role of each nutrient in the body.	Explain how each nutrient contributes to a balanced diet.
	State that food can be tested for starch, lipids, sugar, and protein	Describe how to test food for starch, lipids, sugar, and protein.	Explain why testing food for starch, lipids, sugar, and protein is important.
	State one potential problem for someone with an unhealthy diet.	Describe some health issues caused by an unhealthy diet.	Explain how an unhealthy diet causes health issues.
	State that different people require different amounts of energy.	Calculate the energy requirements of different people.	Explain that different people require different amounts of energy, using energy calculations and data to support explanations.
2. Digestive system	Name the main organs of the digestive system.	Describe the process of digestion.	Explain how each part of the digestive system works in sequence, including adaptations of the small intestine for its function.
		Describe the structure and function of the main parts of the digestive system.	
	Name some enzymes used in digestion.	Describe the role of enzymes in digestion.	
3. Breathing and Gas exchange	State that the parts of the gas exchange system are adapted to their function	Describe how the parts of the gas exchange system are adapted to their function	Explain how the parts of the gas exchange system are adapted to their function
	State what happens to the ribcage and diaphragm during inhaling and exhaling	Describe the process of inhaling and exhaling	Explain the process of inhaling and exhaling (linking structure with process)
	State what each part of the bell jar model represents	Describe how a bell jar can be used to model what happens during breathing	Evaluate the bell jar model which is used to explain what happens during breathing.
n/a	State a value of lung volume.	Explain how to measure lung volumes	