

Scheme of work: The human body

This resource provides guidance for teaching component 1: The human body from our new Entry Level Certificate Science. It is based on the specification (5960).

The scheme of work is designed to be a flexible medium term plan for teaching content and development of the skills that will be assessed.

3.1 Component 1 – Biology: The human body

Spec ref.	Summary of the specification content	Learning outcomes <i>What most students should be able to do</i>	Suggested timing (hours)	Opportunities to develop Scientific Communication skills	Opportunities to develop and apply practical and enquiry skills	Resources
3.1.1 O1 cf 3.2.3 O10	Animal cells	<p>Recall the parts of human cells:</p> <ul style="list-style-type: none"> • Nucleus – controls the activities of the cells and contains the genetic material; • Cytoplasm – where most chemical activities take place; • Cell membrane – controls the passage of substances in and out of cells. <p>Describe how specialised cells are adapted for their function.</p>	2	<p>Use scientific vocabulary correctly.</p> <p>Recap knowledge of animal cells from KS3.</p> <p>Label a simple diagram of an animal cell.</p> <p>Draw/label specialised animal cells showing their specific features and what they are used for.</p> <p>Card sort to relate structure to function of animal cells.</p> <p>“What am I?” guessing game to consolidate knowledge.</p>	<p>Correctly use a microscope/Bioviewer to observe prepared slides under different magnifications.</p> <p>Prepare a sample of human cells from a basic cheek swab.</p>	<p>National Stem Centre – Cells and organ systems contains a variety of activities for O1 which can be used at every level</p> <p>BBC Bitesize – Plant and animal cell structures</p>

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O2	Tissues, organs and systems	<p>Recall these definitions:</p> <ul style="list-style-type: none"> • Tissue – a group of cells with a similar structure and function; • Organ – groups (aggregations) of tissues performing similar functions; • Organ systems – organs which work together. <p>Recognise the position of the major organs (brain, heart, liver, lungs, kidneys and reproductive organs) in the human body.</p> <p>Describe the functions of the major organs.</p>	2	<p>Use scientific vocabulary correctly.</p> <p>Card sort cell, tissue, organs, systems using pictures.</p> <p>Cut and stick organs onto 'empty' torso.</p> <p>Organ 'Bingo'.</p>		

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		<p>Recall that the human circulatory system is made up of the heart and the blood.</p> <p>Describe how the heart pumps blood round the body in a dual circulatory system.</p> <p>Recall that blood transports oxygen, proteins and other chemical substances around the body.</p> <p>Recognise the different types of blood cells.</p>	2	<p>Use scientific vocabulary correctly.</p> <p>Use AQA Teachit KS3: <i>Modelling the heart</i> to produce a poster to explain the structure.</p> <p>Use AQA Teachit KS3: <i>Modelling the circulatory system</i> to identify the parts of the system.</p> <p>Use AQA Teachit KS4: <i>Circulatory system jigsaw</i></p> <p>Draw/label diagrams of blood cells</p>	<p>Demo: model heart.</p> <p>Demo/student dissection of sheep's heart/pluck.</p> <p>Observe blood smear slides under the microscope/Bioviewer</p> <p>Use Youtube computer simulation to show flow of blood.</p>	<p>BBC Bitesize: Blood</p> <p>Teachit Science - Modelling the heart</p> <p>Teachit Science - Modelling the circulatory system</p> <p>Teachit Science - The circulatory system, jigsaw</p> <p>YouTube - Blood flow simulation</p>

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O3	The human digestive system	<p>Recall the parts of the human digestive system and be able to identify them on a diagram.</p> <p>Understand the role of enzymes in digestion.</p>	<p>2</p> <p>0.5</p>	<p>Use scientific vocabulary correctly.</p> <p>Label a diagram of the digestive system.</p> <p>Create a digestive system word search and test it on other students.</p> <p>Model for digestion using popper beads to illustrate how larger molecules are broken into smaller ones.</p>	<p>View slides of various digestive system tissues under the microscope/Bioviewer .</p> <p>Observe changes from savoury to sweet as plain bread is chewed.</p>	<p>BBC Bitesize - Nutrient groups and digestion</p> <p>BBC Bitesize - Digestion in the mouth</p> <p>BBC Bitesize - Digestion in the small intestine</p>
3.1.2 O4	Respiration	<p>Recall that respiration is a cellular process that releases energy</p> <p>Understand that breathing and respiration are not the same</p> <p>Recall that glucose comes from the diet and oxygen and carbon dioxide gases are exchanged</p>	1	<p>Use scientific vocabulary correctly.</p> <p>Word-spot key vocabulary from the BBC Bitesize videos.</p> <p>Discuss the difference between respiration and</p>	<p>Compare the carbon dioxide content of inhaled and exhaled air using limewater.</p> <p>Demonstrate water vapour production by clouding a mirror with exhaled breath.</p>	<p>BBC Bitesize - Aerobic respiration</p> <p>BBC Bitesize - Respiration - the release of energy</p> <p>BBC Bitesize -</p>

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		<p>through the lungs</p> <p>Recall the word equation for respiration: <i>glucose + oxygen → carbon dioxide + water</i></p>		<p>breathing and use AQA Teachit <i>Respiration – true or false?</i> to summarise.</p> <p>Card sort the words for the respiration equation</p> <p>Brainstorm energy-giving foods in day-to-day diet.</p> <p>Use thermograms pictures to show infra-red radiation given off by living things.</p>		<p>Gaseous exchange in the lungs and the importance of alveoli</p> <p>Teachit Science - Respiration</p>
	Lifestyle and health	<p>Demonstrate an understanding of the effect that lifestyle can have on people's health eg the links between:</p> <ul style="list-style-type: none"> diet, exercise and obesity and type 2 diabetes; smoking and cancer; alcohol and liver and brain function. <p>Describe the right balance of energy and different food groups</p>	2-3	<p>Use scientific vocabulary correctly.</p> <p>Discuss good and poor lifestyle choices.</p> <p>Research one of the links to produce an information leaflet/PowerPoint and feed back to the class.</p> <p>Discuss how being under or</p>	<p>TDA (Teacher-devised assignment) opportunity: Compare the energy released by burning different foods eg. low-fat crisp or rice cake and normal one.</p>	<p>BBC Bitesize - The importance</p>

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		<p>required for good health.</p> <p>Recognise that people who exercise regularly are usually fitter than people who take little exercise.</p>		<p>overweight can affect a human's health.</p> <p>Use AQA Teachit 'How much sugar are we drinking?' (This will also use some simple mathematical skills)</p> <p>Evaluate someone's fitness by their pulse recovery time and consolidate with AQA Teachit: <i>Fit and healthy – true or false?</i></p>	<p>TDA opportunity: Investigate the effect of exercise on pulse rate.</p> <p>TDA opportunity: Investigate the effect of caffeine drinks on pulse rate.</p>	<p>of a balanced diet</p> <p>Teachit Science - How much sugar are we drinking?</p> <p>Teachit Science - Fit and healthy?</p>
3.1.3 O5	Infectious diseases	<p>Recall that infectious diseases are caused by microorganisms called pathogens.</p> <p>Recall that pathogens include both bacteria and viruses and may produce poisons (toxins) that make us feel ill.</p> <p>Recall that viruses damage the cells in which they reproduce.</p>	2	<p>Use scientific vocabulary correctly.</p> <p>Watch BBC video clip on microorganisms list the pathogens.</p> <p>Talk about infection and what it means. Look at pictures of bacterial cells and viruses.</p>	<p>Use UV powder on door handles at start of lesson and black</p>	<p>BBC Bitesize - Microorganisms</p> <p>BBC Bitesize - Human immunity and defence</p> <p>Teachit Science - Bacteria killers</p>

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				<p>Use AQA Teachit KS3 <i>Bacteria killers</i></p> <p>Use AQA Teachit <i>Disease – what's that word?</i> team game.</p> <p>Introduce the idea of hygiene as a prevention.</p>	<p>light to show transfer of pathogen/play catch with soft ball.</p>	<p>Teachit Science - Disease- what's that word?</p> <p>BBC Bitesize - The importance of handwashing in food hygiene</p>
O6	<p>The role of white blood cells</p>	<p>Recognise the two main types of white blood cells: those that ingest bacterial cells and those that produce antibodies.</p> <p>Recall that vaccination is used to stimulate the immune response using dead or inactive forms of a pathogen to produce antibodies.</p>	2	<p>Use scientific vocabulary correctly.</p> <p>Use blank outline of the human body and challenge to mark on all the places pathogens could enter and how the body stops them.</p> <p>Use ABPI clip and produce story board of sequence.</p>		<p>BBC Bitesize - White blood cells</p> <p>ABPI - White blood cells/ response to infection</p>

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		Describe how vaccination is used in the prevention of disease.		<p>Role play parts from the Jenner clip to look at the views of the boy and his mother and consider the ethics of Jenner's work.</p> <p>Draw up a personal vaccination history.</p> <p>Debate the idea of anti-vaccination campaign groups.</p>	<p>Compare graphs showing death rates from diseases pre and post vaccination campaigns.</p>	<p>BBC Bitesize - The life and work of Edward Jenner</p> <p>ABPI - Vaccination</p>
07	Medicinal drugs	<p>Recall that medical drugs are developed and carefully tested before they can be used to relieve illness.</p> <p>Recall that drugs change the</p>	2	<p>Use scientific vocabulary correctly.</p> <p>Discuss drug safety and how drugs are tested today.</p> <p>Use cards/cut-outs to sequence the stages in drug testing and trialling and explain the purpose of each stage.</p>	<p>Research some traditional drugs eg digitalis and make a poster or presentation about them.</p>	<p>BBC Bitesize - Targeted research</p> <p>BBC Bitesize - Human drug trials</p> <p>Teachit Science - Introduction to drugs</p> <p>Teachit Science -</p>

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		<p>chemical processes in the human body.</p> <p>Recognise that people can become dependent or addicted to drugs and suffer withdrawal symptoms without them.</p> <p>Recall that antibiotics such as penicillin can kill bacterial pathogens.</p> <p>Recall that they cannot be used against viral pathogens.</p>		<p>Discuss the safety issues of growing microorganisms in a lab.</p>	<p>TDA opportunity: Use of pre-inoculated agar in Petri dishes to evaluate the effects of disinfectants and antibiotics.</p>	<p>Learning grid, use and abuse of drugs</p> <p>BBC Bitesize - Fleming and the discovery of penicillin</p>
3.1.4 08	The nervous system	<p>Recall that the human body has automatic control systems: the nervous and (endocrine) hormonal systems.</p> <p>Recall that reflex actions are automatic and rapid.</p> <p>Describe examples of common reflex responses.</p>	1	<p>Use scientific vocabulary correctly.</p>	<p>TDA opportunity: Comparing different peoples' reaction time using the catch response with a ruler</p>	<p>BBC Bitesize - The nervous system activity</p> <p>Reaction time test</p> <p>BBC Sheep reaction time test</p>

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					or a reaction time programme.	
O9	Hormonal control	Recall that hormones are secreted by glands and are transported to target organs by the bloodstream.	1	Use scientific vocabulary correctly. Label the main endocrine glands on an outline of the body. Complete table to show the main hormones and target organs.	Research a disease caused by incorrect hormone levels eg diabetes.	
		Recall that the menstrual cycle is controlled by several hormones some of which promote egg release. Recognise the main features of the menstrual cycle described diagrammatically.	1	Watch the BBC clip about the menstrual cycle and discuss the stages. Use a month calendar page to colour code days according to hormone levels and changes. Use AQA Teachit KS3 <i>Fertilisation</i> board game to consolidate learning.		BBC Bitesize: Menstrual cycle Teachit Science - Fertilisation board game

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O10	Hormones can be used to control fertility.	<p>Recall that hormones can be used to inhibit or stimulate egg production.</p> <p>Recall that oral contraceptives contain hormones to inhibit eggs from maturing.</p> <p>Recall that fertility drugs stimulate eggs to mature.</p> <p>Evaluate the benefits and drawbacks of hormonal fertility control.</p>	1	<p>Use scientific vocabulary correctly.</p> <p>Discuss the pros and cons of hormonal contraception.</p> <p>Invite an outside speaker to speak to the students eg nurse.</p> <p>Discuss the implications of IVF treatment for a couple wanting a baby.</p> <p>Discuss possible causes of infertility in men and women and treatments available.</p>		<p>Exhibition materials can be obtained from the</p> <p>Family Planning Association</p> <p>BBC Bitesize - How small is a human egg?</p> <p>BBC Bitesize - Ovulation</p> <p>BBC Bitesize - Human fertilisation</p>