

Long Term Plan: Biology Year 10

“Science is simply the word we use to describe a method of organising our curiosity.”

The programme for Y10 and 11 differs in comparison to KS3. There are 4 sets in each population. X/Y1, 2, 3 and 4 classes will be taught combined science content and will see a subject specialist teacher three times a fortnight. Set 5 is the triple science group who will see their teachers on a 5,5,4 split.

There are 2 data collection points for Y10

Staff use the [Curriculum Road Map](#) to ensure they teach the correct topic with enough time to cover the depth and breadth of our curriculum.

Topic	Unit title	Key knowledge/ Content to learn and retain	Essential skills to acquire (subject & generic)	Anticipated misconceptions	Links to previous KS	Links to future KS	Opportunity for stretch for high prior attainers
One	Organisation & Digestion	Describe the levels of organisation in the body, understand the size and scale of these levels Describe the pathway through the digestive system Explain how the small intestine is adapted for its function	Practical Skills: <ul style="list-style-type: none"> Modelling the digestive system carry out experiments appropriately having due regard for the correct manipulation of apparatus, and health and safety considerations. Use scientific theories and explanations and hypothesis on how pH 	Organs can only belong to one organ system. Some pupils may be confused between the respiratory system and respiration - thinking that respiration is breathing Eating is the same as digestion https://educationendowmentfoundation.org.uk/public/files/EEF_BEST	In Year 7 pupils are first introduced to the levels of organisation . This is an opportunity to revisit and consolidate	4.3 Health & Disease 4.5 Homeostasis	

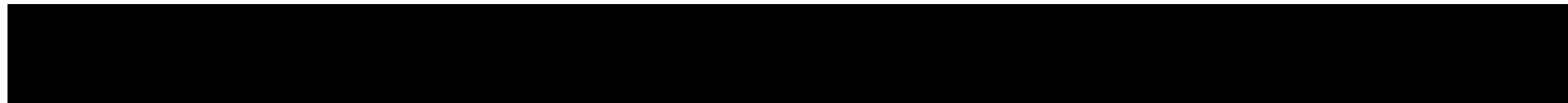
		<p>State the key nutrients we need and describe how to test for them</p> <p>Describe what each nutrient is made up from and how to test for it.</p> <p>Use qualitative reagents to test for a range of carbohydrates lipids and proteins</p> <p>Use the lock and key theory to explain enzyme action</p> <p>Identify the enzyme needed and products of digestion of each nutrient</p> <p>Investigate the effect of pH on enzyme action (RP)</p> <p>Explain The effect of pH on enzyme action</p> <p>Explain The effect of Temperature on enzyme action</p> <p>Explain the roles of hydrochloric acid and bile in making digestion more efficient</p>	<p>affects amylase activity.</p> <ul style="list-style-type: none"> • Make and record observations and measurements of time. <p>Scientific Skills:</p> <ul style="list-style-type: none"> • Students should be able to use other models to explain enzyme action. • present a graph of amylase activity against pH • translate numeric data into graphical form 	<p>_infographic_-_Digestion.pdf</p> <p>Pupils struggle to make the connection between liver, gallbladder and the rest of the digestive system</p>	<p>The organs and the function of the digestive system are studied in Year 8. Diffusion and surface area are revisited.</p> <p>Some of the food tests are undertaken in Year 8</p> <p>Pupils have been introduced to digestive enzymes and their role in year 8</p>		
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		Recall how the small intestine is adapted to exchange materials					
SMSC & British Values	British values in science						
Cultural Capital	Use of wash powder and baby food within the industry						
Career Link	https://www.bbc.co.uk/bitesize/tags/zjb8f4j/jobs-that-use-science/1 , https://www.bradfordacademy.co.uk/wp-content/uploads/2019/10/CEIAG-in-the-Curriculum-Science.pdf , https://www.pearson.com/uk/educators/schools/subject-area/science/why-science-matters/your-future-in-stem-a-z.html More information here .						
Two	Transport in Animals	<p>Describe the components of blood and explain their functions</p> <p>Recognise different types of blood cells in a photograph or diagram and explain how they are adapted to their function</p> <p>Explain how the structure of blood vessels relates to their function</p>	<p>Practical Skills:</p> <ul style="list-style-type: none"> ● Possible heart dissection <p>Scientific Skills:</p> <ul style="list-style-type: none"> ● Observing and drawing blood cells seen under a microscope. Evaluate risks related to use of blood products. ● Use models to explain the adaptations of blood vessels ● Evaluate methods of treatment bearing in 	<p>Pupils struggle with the idea of what blood is made up of. That plasma is the liquid part of the blood. That we have blue blood. That blood clotting is always harmful - associated with blood clots that could cause deep vein thrombosis as an example</p> <p>The blood pressure in the capillaries is lower than that in the arteries</p>	Year 7 structure and function of our body - gas exchange. In Year 6 pupils covered the following objectives: identify and name the main parts of the human circulatory		

		<p>Describe double circulation</p> <p>Describe the structure of the heart</p> <p>Describe coronary heart disease and its treatment</p> <p>Evaluate the advantages and disadvantages of treating cardiovascular diseases by drugs, mechanical devices or transplant</p> <p>Identify the structures of the respiratory system</p> <p>Explain how the lungs are adapted for gaseous exchange</p>	<p>mind the benefits and risks associated with the treatment.</p> <ul style="list-style-type: none"> Use models to explain the adaptations of the alveoli 	<p>and veins because the narrow capillaries offer great resistance to blood flow.</p> <p>https://educationendowmentfoundation.org.uk/public/files/Publications/Science/What_colour_is_deoxygenated_blood.pdf The heart is found on the left hand side of the chest, The heart pumps air around the body,</p> <p>Respiration takes place in the lungs</p>	<p>system, and describe the functions of the heart, blood vessels and blood. recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. Pupils have also previously studied transport across membranes and factors affecting it.</p>		
SMSC & British Values	British values in science						
Cultural Capital	Organ / blood donations - the ethics surrounding these						
Career Link	https://www.bbc.co.uk/bitesize/tags/zjb8f4i/jobs-that-use-science/1 , https://www.bradfordacademy.co.uk/wp-content/uploads/2019/10/CEIAG-in-the-Curriculum-Science.pdf , https://www.pearson.com/uk/educators/schools/subject-area/science/why-science-matters/your-future-in-stem-a-z.html More information here .						

Three	Infection and response	<p>Pathogens and modes of transmission</p> <p>The function of key components of the immune system</p> <p>How vaccines work</p> <p>Antibiotics, painkillers and the development of new drugs</p>	<p>Interpreting data in graphical and tabular form</p> <p>Reading for comprehension</p> <p>Extended writing</p>	<p>That white blood cells “eat” invaders - students must refer to phagocytosis.</p> <p>Potential for confusion between antibody and antigen</p> <p>That bacteria “learn” rather than evolve to be resistant to antibiotics</p> <p>All bacteria are bad and cause infectious diseases.</p>	Builds from unit 10. Health and Disease at KS3, which laid the foundations of disease transmission and immune system function	<p>The immune system and immunity forms the entirety of learning aim B, in the first unit of the Applied Human Biology course.</p> <p>In A-Level biology students will study Cell recognition, T-Cell and B-Cell Function, HIV and the use of monoclonal antibodies</p>	<p>Students could consider ideas of herd immunity and why it is important for those that can be vaccinated to be vaccinated.</p> <p>Students could consider how a white blood cell can tell if a cell is self or non-self</p> <p>Students could look at the rise of antibiotic resistant bacteria</p>
SMSC & British Values	British values in science						
Cultural Capital	Impact of a healthy V unhealthy lifestyle on the mental health & wellbeing of individuals and communities.						
Career Link	https://www.bbc.co.uk/bitesize/tags/zjb8f4j/jobs-that-use-science/1 , https://www.bradfordacademy.co.uk/wp-content/uploads/2019/10/CEIAG-in-the-Curriculum-Science.pdf , https://www.pearson.com/uk/educators/schools/subject-area/science/why-science-matters/your-future-in-stem-a-z.html More information here .						
Four	Inheritance variation and evolution	<p>The structure of DNA</p> <p>Genes and alleles; including the concepts of recessive alleles,</p>	<p>Calculation of simple probability</p> <p>Writing and interpreting tree charts</p>	Alleles as different genes rather than different versions of a gene	This unit builds on the study of heredity and evolution that is	Study of genetics forms the basis of an entire unit of study in both A-	<p>Sex linked traits</p> <p>Advantages and disadvantages of</p>

		<p>dominant alleles, homozygous and heterozygous</p> <p>Sexual vs asexual reproduction</p> <p>Inheritance and punnet squares</p> <p>Inheritance of sex and genetic disorders</p> <p>Evolution by natural selection</p> <p>Evidence for evolution, including fossils and genetic evidence</p> <p>Classification</p> <p>How human understanding of genetics has changed over time,</p> <p>Cloning and genetic engineering</p>	<p>Extended writing</p> <p>Calculation of simple probability</p> <p>Writing and interpreting tree charts</p> <p>Extended writing</p>	<p>Confusion between genotype and phenotype</p>	<p>completed in year 8</p>	<p>Level biology and Applied human Biology</p>	<p>sexual be asexual reproduction and why organisms capable of both would choose a strategy</p>
SMSC & British Values	<p>British values in science</p> <p>Inherited disorders and issues around family planning</p>						
Cultural Capital	<p>Charles Darwin and the voyage of the beagle</p> <p>Historical debate around evolution</p>						
Career Link	<p>https://www.bbc.co.uk/bitesize/tags/zjb8f4j/jobs-that-use-science/1, https://www.bradfordacademy.co.uk/wp-content/uploads/2019/10/CEIAG-in-the-Curriculum-Science.pdf, https://www.pearson.com/uk/educators/schools/subject-area/science/why-science-matters/your-future-in-stem-a-z.html</p> <p>More information here.</p> <p>Medical research</p> <p>Family planning adviser</p> <p>Genealogist</p>						



<p>Five - TRIPLE ONLY</p>	<p>Homoeostasis and response</p>	<p>The definition of Homeostasis</p> <p>The nervous system and reflex arcs</p> <p>Negative feedback and the control of glucose</p> <p>Control of the menstrual cycle, including fertility treatment and hormonal contraception</p>	<p>Drawing and labelling scientific diagrams</p> <p>Collecting recording accurate data</p> <p>Presenting and interpreting data in tabular and graphical form.</p> <p>Extended Writing</p> <p>Collecting recording accurate data</p> <p>Presenting and interpreting data in tabular and graphical form.</p> <p>Extended Writing</p>	<p>Blood sugar - students often don't identify this with glucose.</p> <p>Students often confuse the three different hormones that control the menstrual cycle</p>	<p>Builds from the study of nutrition and digestion in year 9, which explores how humans obtain the glucose they use for energy from their diet.</p> <p>Also builds from previous study of the circulatory system as a transport mechanism</p> <p>Previous work at KS3 on the circulatory system as transport mechanism</p> <p>(Triple Only) Plant growth, and xylem and phloem.</p>	<p>Study of homeostasis and negative feedback loops is continued in greater depth in both A-Level biology and Applied Human Biology</p> <p>Study of homeostasis and negative feedback loops is continued in greater depth in both A-Level biology and Applied Human Biology</p>	<p>Treatment of diabetes and comparison of type one and type two.</p> <p>Students can consider why negative feedback loops are suited to control of homeostasis</p> <p>Treatment of diabetes and comparison of type one and type two.</p> <p>Students can consider why negative feedback loops are suited to control of homeostasis</p>
<p>SMSC & British Values</p>	<p>British values in science</p> <p>Appropriate usage of contraception, particularly hormonal options</p>						
<p>Cultural Capital</p>	<p>Impact of a healthy V unhealthy lifestyle on the mental health & wellbeing of individuals and communities.</p> <p>How different communities feel about and use hormonal contraceptives</p>						

Career Link	https://www.bbc.co.uk/bitesize/tags/zjb8f4j/jobs-that-use-science/1 , https://www.bradfordacademy.co.uk/wp-content/uploads/2019/10/CEIAG-in-the-Curriculum-Science.pdf , https://www.pearson.com/uk/educators/schools/subject-area/science/why-science-matters/your-future-in-stem-a-z.html More information here .
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Six	Revision and preparation for GCSE exams
	Revisit to subject knowledge from across the course & use of PLC to ensure that students have a good grasp of all aspects of the specification
	Use of retrieval quizzes and activities to identify gaps in SK and misconceptions
	Support students in developing summary notes, flash cards etc to aid retrieval of key facts
	Ensure that students have the necessary skills for effective revision
	Focus on past exam questions and papers – command words and application of knowledge
	Practice the application of knowledge that draws upon the practical aspects of the course
	Timed completion of questions to support with pace through the exam paper
	SLOP style activities to ensure that all are prepared for the aspects of maths that will be present on the exam papers