

Curriculum Content Map		Subject: Biology Triple																					
Month		September		October		November		December		January		February		March		April		May		June		July	
Units of Work		Topic 6- Plant structures and their functions Topic 7 - Animal co-ordination, control and homeostasis		Topic 7 - Animal co-ordination, control and homeostasis Topic 8 - Exchange and transport in animals		Topic 7 - Animal co-ordination, control and homeostasis Topic 8 - Exchange and transport in animals		Topic 8 - Exchange and transport in animals		Topic 8 - Exchange and transport in animals		Topic 9 - Ecosystems and material cycles		Topic 9 - Ecosystems and material cycles		Revision		Revision		Revision		Revision	
Cultural Transmission	National Curriculum area – KS3	Photosynthesis • photosynthesis as the key process for food production and therefore biomass for life • the process of photosynthesis • factors affecting the rate of photosynthesis. Transport systems • the need for transport systems in multicellular organisms, including plants		Coordination and control • principles of hormonal coordination and control in humans • hormones in human reproduction, hormonal and non-hormonal methods of contraception • homeostasis.		Transport systems • the need for transport systems in multicellular organisms, including plants • the relationship between the structure and functions of the human circulatory system.		Cell biology the importance of cellular respiration; the processes of aerobic and anaerobic respiration		Cell biology the importance of cellular respiration; the processes of aerobic and anaerobic respiration		Ecosystems • levels of organisation within an ecosystem • some abiotic and biotic factors which affect communities; the importance of interactions between organisms in a community		Ecosystems how materials cycle through abiotic and biotic components of ecosystems • the role of microorganisms (decomposers) in the cycling of materials through an ecosystem • organisms are interdependent and are adapted to their environment • the importance of biodiversity • methods of identifying species and measuring distribution, frequency and abundance of species within a habitat • positive and negative human interactions with ecosystems.		Revision		Revision		GCSE Examinations		GCSE Examinations	
	Substantive Knowledge	<b>The What!</b> Describe the need to transport substances into and out of a range of organisms, including oxygen, carbon dioxide, water, dissolved food molecules, mineral ions and urea. Explain the need for exchange surfaces and a transport system in multicellular organisms including the calculation of surface area : volume ratio. The process of photosynthesis, how a leaf is adapted for photosynthesis and why photosynthesis is important for almost all life on Earth. The limiting factors of photosynthesis, including light intensity, and how they change the rate of photosynthesis. How plant roots use diffusion, osmosis and active transport to transport substances, and how root hair cells are adapted to their functions. Factors affecting the rate of transpiration, the translocation of sugar in plants and how the structures of xylem and phloem are adapted to their functions.		Describe where hormones are produced and how they are transported from endocrine glands to their target organs, including the pituitary gland, thyroid gland, pancreas, adrenal glands, ovaries and testes. The effect of thyroxine on metabolic rate, how a negative feedback mechanism can control the amount of thyroxine in the blood and how adrenalin prepares the body for 'fight or flight'. The menstrual cycle, the roles of oestrogen and progesterone, and how hormones and barrier methods can be used as contraception. How hormones control the menstrual cycle, prevent pregnancy and increase the chance of pregnancy. Osmoregulation, kidney disease and the effect of ADH on the collecting duct of the kidney		Explaining what homeostasis is, how blood glucose concentration is regulated and how type 1 diabetes can be controlled. How type 2 diabetes is caused, controlled and correlates to body mass. Evaluate the correlation between waist : hip calculations and BMI, using the BMI equation:  BMI = weight (kg) ÷ (height (m)) <sup>2</sup>		Investigating the structure of the heart and understand how the heart and lungs work together to ensure that the tissues of the body have enough oxygen for respiration.		Comparing the exchange surfaces of the body with a particular focus on the breathing system. Attention is paid to how exchange surfaces are adapted to their function		The first part of the unit introduces students to ecosystems, abiotic and biotic factors and communities, parasitism, biodiversity and the principle of food security. Evaluating the use of indicator species as evidence to assess the level of pollution, including a polluted water – bloodworm, sludgeworm b clean water – freshwater shrimps, stonefly c air quality – different species of lichen, blackspot fungus on roses.		The final part of this topic revisits the concepts of nutrient recycling with a particular focus on the water, carbon and nitrogen cycles. decomposition.		Teachers will plan individual lessons dependent on the strengths and weaknesses of individual groups		Teachers will plan individual lessons dependent on the strengths and weaknesses of individual groups		GCSE Examinations		GCSE Examinations	
	Disciplinary Knowledge	<b>The How!</b> Recognise and use expressions in decimal form. Use ratios, fractions and percentages. Calculate areas of triangles and rectangles, surface areas and volumes of cubes. Understand that $y = mx + c$ represents a linear relationship. Plot two variables from experimental or other data. Determine the slope and intercept of a linear graph. Substitute numerical values into algebraic equations using appropriate units for physical quantities. Understand that $y = mx + c$ represents a linear relationship. Determine the slope and intercept of a linear graph. Demonstrate an understanding of rate calculations for transpiration.		Recognise and use expressions in standard form. Construct and interpret frequency tables and diagrams, bar charts and histograms. Translate information between graphical and numeric form. Plot two variables from experimental or other data. Understand the principles of sampling as applied to scientific data.		Construct and interpret frequency tables and diagrams, bar charts and histograms. Translate between graphical and numeric form. Plot two variables from experimental or other data. Use ratios, fractions and percentages. Understand simple probability. Understand and use the symbols: $=, <, <<, >, >>, >, <, <<, >>, <=, >=$ . Students will be controlling variables in the investigation into the effect of surface area on diffusion rate. calculation of surface area		The safe use of dissection equipment to investigate the gross structure of the heart. Recognise and use expressions in decimal form. Use an appropriate number of significant figures. Fick's law use to calculate rate of diffusion. Understand and use the symbols: $=, <, <<, >, >>, >, <, <<, >>, <=, >=$ . Change the subject of an equation. Translate information between graphical and numeric form. Plot two variables from experimental or other data. The use of ratios, fractions and percentages		Measurement of volumes of liquid using a respirometer and the surface area of the diameter of a capillary tube. Recognise and use expressions in decimal form. Recognise and use expressions in standard form. Use ratios, fractions and percentages. Understand and use the symbols: $=, <, <<, >, >>, >, <, <<, >>, <=, >=$ . Core Practical: Investigate the rate of respiration in living organisms.		Students will: Use ratios, fractions and percentages. Construct and interpret frequency tables and diagrams, bar charts and histograms. Understand the principles of sampling as applied to scientific data.		Students will: Complete a core practical: Investigate the relationship between organisms and their environment using field-work techniques, including quadrats and belt transects. Construct and interpret frequency tables and diagrams, bar charts and histograms. Understand the principles of sampling as applied to scientific data.		Students will: Complete a range of individual activities dependent of the strengths and weaknesses of individual groups		Students will: Complete a range of individual activities dependent of the strengths and weaknesses of individual groups		Students will: Complete a range of individual activities dependent of the strengths and weaknesses of individual groups		GCSE Examinations	
	Sequencing (Flow)	<b>Retrieval &amp; Extension</b> From KS3 - Photosynthesis From year 10 CB1 Key Concepts in biology specialised cells		From KS3: How obesity is caused, structure and function of the human reproductive system, the menstrual cycle From year 10 CB1 Key Concepts in biology: The structure of sperm and egg cells how enzymes help digest food molecules		From KS3: How obesity is caused, structure and function of the human reproductive system, the menstrual cycle Digestion How the breathing system gets oxygen into the blood Aerobic and anaerobic respiration From year 10 CB1 Key Concepts in biology: The structure of sperm and egg cells how enzymes help digest food molecules Diffusion Animal cells and their adaptations		From KS3: How the breathing system gets oxygen into the blood Aerobic and anaerobic respiration From year 10 CB1 Key Concepts in biology: Diffusion Animal cells and their adaptations		From KS3: How the breathing system gets oxygen into the blood Aerobic and anaerobic respiration From year 10 CB1 Key Concepts in biology: Diffusion Animal cells and their adaptations		From KS3: How life on earth relies on photosynthesis interdependence of organisms, including food webs and insect pollination		N/A		N/A		N/A		N/A		GCSE Examinations	
	Summative Assessment	Students will complete a range of activities such as long answer examination questions, multiple choice questions and short answer questions		Students will complete a range of activities such as long answer examination questions, multiple choice questions and short answer questions		Students will complete a range of activities such as long answer examination questions, multiple choice questions and short answer questions AP1 mock examinations		Students will complete a range of activities such as long answer examination questions, multiple choice questions and short answer questions		Students will complete a range of activities such as long answer examination questions, multiple choice questions and short answer questions AP2 Mock Examinations		Students will complete a range of activities such as long answer examination questions, multiple choice questions and short answer questions		Students will complete a range of activities such as long answer examination questions, multiple choice questions and short answer questions AP3 Mock examinations		Students will complete a range of activities such as long answer examination questions, multiple choice questions and short answer questions		Students will complete a range of activities such as long answer examination questions, multiple choice questions and short answer questions		Students will complete a range of activities such as long answer examination questions, multiple choice questions and short answer questions		GCSE Examinations	
	Personal Empowerment	Virtue	<b>Friendliness &amp; Civility</b>		<b>Justice &amp; Truthfulness</b>		<b>Courage</b>		<b>Generosity</b>		<b>Gratitude</b>		<b>Good Speech</b>		<b>Good Temper &amp; Humour</b>		<b>Self-Mastery</b>		<b>Compassion</b>		<b>Good Sense</b>		
Link to Virtue		The opportunity to reflect, think deeply and critically about an issue. Students will need to demonstrate friendliness and civility as they work in groups to complete a variety of different practical activities. They will need to demonstrate civility as they work towards a method to ensure they are civil with each other to achieve a common goal.		Students will demonstrate truthfulness within their work as they reflect on their finding within an investigation. Students will look at the justice on each results and determine if they are reaching their full potential.		Within the lessons, students will need to have the courage to answer the questions with their learning. Students will need to demonstrate their understanding of the courage by applying their learning to their exams and independent practice within lessons.		Students will need to demonstrate generosity of as they work with groups and demonstrate their understanding of their learning. They will need to be generous with their time and comments towards each other.		Within lessons students will need to demonstrate their gratitude towards their teachers who plan their lesson but also their fellow students as they work together to achieve a common goal.		Student will demonstrate good speech within their lessons by demonstrating their key words within lessons and their work.		As students work within group they will need to demonstrate, good temper as they work towards a practical to achieve the independent practice. Students will need to demonstrate good humour as they can work together and laugh as each other learn		Students will need to aim high for their up and coming exams. Students will need to revise in their own time and ensure they are fully prepared for their GCSEs		Students will need to aim high for their up and coming exams. Students will need to revise in their own time and ensure they are fully prepared for their GCSEs		Students will have compassion for other students during the stressful examination period and will offer support to one another at this time		GCSE Examinations	
Preparation for Work	Skill	<b>Listening</b>		<b>Leadership</b>		<b>Problem-Solving</b>		<b>Creativity</b>		<b>Staying Positive</b>		<b>Speaking</b>		<b>Staying Positive</b>		<b>Aiming High</b>		<b>Speaking</b>		<b>Teamwork</b>			
	Link to Skill	Students will need to listen to safety instructions and instructions for practical activities to ensure that they carry out the activities correctly and safely		Students will use leadership skills when working in groups to discuss fertility and how bit can be treated.		Students will need to use their <u>problem-solving</u> skills to be able to draw conclusions from data in the investigating diffusion investigation		Students will express creativity during this topic when they draw and annotate biological drawings and when they use modelling to actively demonstrate how substances cross membranes		Students will need to stay positive as they learn new key words and definitions. Building on their previous knowledge		Students will use good speech to accurately describe the cycles which ensure that we have enough carbon to manufacture carbohydrates for living organisms, nitrogen for making proteins and water for biological reactions.		Students will need to use good temper and good humour when they investigate the issues surrounding the delicate balance of the nutrient cycles and the consequences of unbalancing these cycles.		Self-mastery will be demonstrated while revising for the GCSE exams.		Self-mastery will be demonstrated while revising for the GCSE exams.		Students will use speaking skills when revising for the examinations in groups. They will need to ensure that they demonstrate scientific literacy at this time		GCSE Examinations	
Preparation for Citizenship	SMSC & British Values	Respect		Democracy		Cultural		Respect		Moral		Moral		Moral		Moral		Moral		Moral			
	Link to SMSC & British Values	Co-operation in practical activity.		Fertility, infertility and the treatments for infertility Debate - Should infertility treatment be available to all?		Pride in STEM day		Co-operation in practical activity.		Great Backyard Bird Count		Red Nose Day British Science Week World Engineering Day for Sustainable Development		Great Backyard Bird Count		Red Nose Day British Science Week World Engineering Day for Sustainable Development		Great Backyard Bird Count		Great Backyard Bird Count		GCSE Examinations	