

Year 7 Main	Term 1 (until Christmas)				Term 2 (until Easter)				Term 3 (until Summer)			
	Cells				Biological molecules				Who are we?			
Overview	Students will build on their prior knowledge of cells being the building blocks of living things to be able to identify plant and animal cells & their components (including specialised cells) & develop their microscopy skills				Students will gain an understanding of the 7 food groups, their importance & how they are digested, including the structure of the digestive system				Students will gain an understanding of puberty & reproduction in humans, reproduction in plants & the importance of understanding genetics & inheritance			
End point	Be able to identify cells as the fundamental unit of living organisms & identify the similarities & differences between plant & animal cells, including the function of the cell components	Be able to identify specialised cells, linking their structure to their function	Be able to observe, interpret & record cell structure using a light microscope	Be able to describe the role of diffusion in the movement of materials in and between cells	Be able to name the content of a healthy human diet & why each component is needed	Be able to describe the tissues and organs of the human digestive system, including adaptations to function and how the digestive system digests food, including the role of enzymes	Be able to describe the consequences of imbalances in the diet	Be able to carry out food tests for the major food groups, identifying positive test results	Be able to describe reproduction in humans	Be able to describe reproduction in plants	Be able to describe heredity & a simple model of chromosomes, genes and DNA in heredity, including the part played by Watson, Crick, Wilkins and Franklin in the development of the DNA model	Be able to describe the variation between species and within species which can drive natural selection, the importance of maintaining biodiversity & how changes in the environment may leave individuals less well adapted, which in turn may lead to extinction.
Knowledge & Skills	Recognise a plant cell & an animal cell from a diagram Explain why a cell is classified as a plant cell or an animal cell State the function of the organelles found in plant and animal cells Link the function of the organelles to the function of the cell	Recognise different specialised cells from diagrams Label the organelles found in the specialised cells Link the structure of the specialised cell to its function	Label a light microscope Describe how to use a light microscope State the magnification equation Use a light microscope, including drawing the image viewed Calculate the magnification of the image	State the substances that need to be moved into & out of cells Describe how the substances can be moved into & out of cells Explain the factors that can affect the rate of movement of the substances	State the 7 food groups Give examples of foods that are providers of the 7 food groups Explain how the food groups are used by the body	Name the main tissues & organs of the digestive system Describe the role of the main tissues & organs of the digestive system, including how the organs are adapted for their function Describe the role of enzymes, including the effect of temperature & pH on enzymes	Plan a balanced diet, explaining why the diet is balanced Identify the food group(s) that a diet is deficient in Explain the consequences of deficiencies in a diet	State the chemicals needed to test for glucose, starch, protein & fat Describe the methods used to test for glucose, starch, protein & fat Describe a positive test results for glucose, starch, protein & fat	Label the male & female reproductive organs Describe the function of the reproductive organs Describe the process of the menstrual cycle Describe the purpose of puberty Define the term fertilisation Describe the process of producing new life, from gestation to birth	Label the reproductive organs in a plant Describe the function of the reproductive organs in a plant Describe the different forms of pollination & how fertilisation occurs	Define the terms gene, DNA & chromosomes Describe the role of genes & DNA in inheritance Describe the roles of Watson, Crick, Wilkins and Franklin in the development of DNA	Define evolution Describe natural selection Explain causes of extinction & how to maintain biodiversity
Knowledge organisers	Cells				Biological molecules				Who are we?			
Assessment	Knowledge Step Checks and End of Topic assessments which build in content throughout the year											
Reading Opportunities	The development of the microscope (from light microscope to electron microscope)				The benefits of healthy eating				Charles Darwin & the Galapagos Islands			
Writing Opportunities	Writing a method for preparing a slide & using a microscope				Writing a method for testing for the different food groups				Explaining, using examples, the processes of evolution & natural selection			
Vocabulary focus	plant, animal, cell, nucleus, cytoplasm, cell membrane, mitochondria, cell wall, chloroplast, vacuole	sperm cell, egg cell, nerve cell, red blood cell, white blood cell, root hair cell	microscope, magnification, stage, objective lens, eyepiece, image, actual	Diffusion	carbohydrate, protein, fat, vitamins, minerals, fibre, water, energy, storage, growth, repair, health, intestines	salivary glands, mouth, teeth, oesophagus, stomach, small intestine, large intestine, pancreas, liver, anus, protease, amylase, lipase, enzymes, temperature, pH	balanced, deficiencies, scurvy, rickets	protein, fat, starch, sugar, biuret, benedicts, ethanol, iodine	ovaries, fallopian tubes, uterus, egg, sperm, testes, penis, nucleus, fuse, fertilisation, periods, hormones	petal, anther, stamen, stigma, ovary, ovule, sepal, nectary, filament	gene, DNA, chromosome, double helix, bases, strands, bonds, nucleus, 46, 23	characteristics, survival of the fittest, fossils, variation, Darwin, genes, evolution, adapted, disease, predator, habitats, conservation
NC benchmarks	K53 Cells & Organisation	K53 Cells & Organisation	K53 Cells & Organisation	K53 Cells & Organisation	K53 Nutrition & Digestion	K53 Nutrition & Digestion	K53 Nutrition & Digestion	K53 Nutrition & Digestion	K53 Reproduction	K53 Reproduction	K53 Inheritance, Chromosomes, DNA & genes	K53 Inheritance, Chromosomes, DNA & genes
AQA GCSE ref	4.1.1.2 Animal & Plant cells	4.1.1.3 Cell specialisation	4.1.1.5 Microscopy	4.1.3.1 Diffusion	4.2.2.1 The human digestive system	4.2.2.1 The human digestive system	4.2.2.1 The human digestive system	4.2.2.1 The human digestive system	4.5.3.4 Hormones in human reproduction		4.6.1.4 DNA & the genome 4.6.1.5 DNA structure	4.6.2.1 Variation 4.6.2.2 Evolution 4.6.3.1 Theory of evolution 4.6.3.5 Fossils 4.6.3.6 Extinction

Year 8 Main	Term 1 (until Christmas)					Term 2 (until Easter)					Term 3 (until Summer)			
	Life processes					Human Biology					Ecology			
Overview	Students will develop their knowledge of the human body with a focus on the respiratory & circulatory systems, including how to maintain their health. They will also be introduced to the idea of photosynthesis in plants.					Students will develop their knowledge of the human body with a focus on the nervous system, immune system, endocrine system, & the muscular & skeletal systems					Students will develop their understanding of ecology through studying feeding relationships between organisms, how to sample organisms & how human activity can affect an ecosystem			
End point	Be able to describe aerobic & anaerobic respiration in living organisms, including a word summary for both	Be able to describe the reactants in, & products of, photosynthesis, & a word summary for photosynthesis	Be able to describe the structure & functions of the gas exchange system in humans, including adaptations to function	Be able to describe the structure & functions of the circulatory system in humans, including adaptations to function	Be able to describe the effects of recreational drugs (including substance misuse) on behaviour, health & life processes.	Be able to describe the structure & function of the human nervous system	Be able to describe the structure & function of the human immune system	Be able to describe the structure & function of the human endocrine system	Be able to describe the structure & function of the muscular & skeletal systems	Be able to describe the different levels of organisation in an ecosystem	Be able to describe the importance of interdependence and competition	Be able to measure the population size of a common species in a habitat	Be able to describe how organisms are affected by their environment, including the accumulation of toxic materials	
Knowledge & Skills	State the word equation for aerobic respiration State the symbol equation for aerobic respiration State the word equation for anaerobic respiration in muscle cells & yeast cells State the symbol equation for anaerobic respiration in muscle cells Compare aerobic & anaerobic respiration	State the word equation for photosynthesis State the symbol equation for photosynthesis Describe how photosynthesis can be measured	Label the structure of the lungs Describe the adaptations of the lungs for gas exchange Describe & explain the composition of inhaled & exhaled air	Label the structure of the heart Describe what is meant by a double circulatory system Describe the functions of the parts of the heart State the components of the blood & describe their function State the types of blood vessel & describe their function Compare the structure of the blood vessels	State the organs affected by smoking & alcohol State the effects of smoking & alcohol on the body Compare the effects of smoking & alcohol on health	State parts of the nervous system Describe the reflex pathway Explain how the reflex arc is related to its function	State examples of pathogens & how they can make you feel ill Explain how pathogens can be spread State how white blood cells defend the human body against disease Describe the role of the immune system in the defence against disease	Label glands of the endocrine system & state the hormones they produce Describe the function of the hormones produced, including those controlling blood glucose	Label muscles & bones of the human body Describe what is meant by an antagonistic pair of muscles Explain how muscles cause movement of the body Describe the function of bones	Define the term ecosystem Describe living & non-living factors in an ecosystem Define the terms producer, consumer, predator, prey, carnivore, herbivore & omnivore	Draw & label a food chain Explain the impact of changes to populations in a food chain Draw predator-prey graphs Describe predator-prey graphs	State methods of ecological sampling Describe methods of ecological sampling Carry out methods of ecological sampling Write conclusions & evaluate methods of ecological sampling	Define the terms bioaccumulation & eutrophication Describe the effects of bioaccumulation & eutrophication on organisms Explain the effects of bioaccumulation & eutrophication on an environment	
Knowledge organisers	Life processes					Human Biology					Ecology			
Assessment	Knowledge Step Checks and End of Topic assessments which build in content throughout the year													
Reading Opportunities	The effects of exercise on the circulatory & respiratory systems. The effects of caffeine on the circulatory system					Vaccinations & how they work, the effect of caffeine on reaction times					Bees - why are they so important? The effect of climate change on ecosystems			
Writing Opportunities	Explaining how the respiratory system & the circulatory system are adapted to their function. Describing the journey of a red blood cell through the body					Design, carry out & draw conclusions to investigate the effects of distractions on reaction times					Long answer questions explaining the effects of bioaccumulation & eutrophication on the environment, writing a method for sampling			
Vocabulary focus	oxygen, glucose, carbon dioxide, water, energy, mitochondria, lactic acid, ethanol, fermentation, complete, incomplete, breakdown, diffusion	carbon dioxide, water, light, chloroplasts, chlorophyll, oxygen, glucose, energy, stomata, root hair cells, diffusion	oxygen, carbon dioxide, trachea, bronchus, bronchioles, alveoli, capillaries, surfactant, area, blood supply, concentration gradient	heart, atrium, ventricle, valves, artery, vein, capillary, lumen, red blood cell, white blood cell, platelets, plasma, oxygen, glucose, carbon dioxide, pathogens, diffusion, concentration gradient	alcohol, smoking, nicotine, carbon monoxide, tar, addictive, withdrawal symptoms	neurons, sensory, relay, motor, effector, receptor, muscle, gland, eyes, ears, nose, tongue, skin, reflex, spinal cord	bacteria, virus, fungus, protist, pathogen, toxins, white blood cells, phagocytes, lymphocytes, anti toxins, antibodies, engulf, memory cells, antigens	glands, hormones, pancreas, pituitary, thyroid, adrenal, ovary, testes, ADH, thyroxine, adrenaline, oestrogen, testosterone, insulin, glucagon	movement, support, antagonistic, biceps, triceps, hamstrings, quadriceps, skull, fixed joint, ball & socket joint, shoulder, ribs, radius, ulna, humerus, tibia, fibula, femur, hinge joint	ecosystem, habitat, population, species, plants, animals, biotic, abiotic, light, temperature, water, shelter, mates, territory, predator, prey, producer, herbivore, carnivore, omnivore.	food chain, food web, predator, prey, competition, increase, decrease, energy, population	population, species, quadrat, transect, random, repeat, mean, area, habitat	bioaccumulation, eutrophication, population, habitat, fertiliser, pesticides, build-up, algae, oxygen	
NC benchmarks	K3 Cellular Respiration	K3 Photosynthesis	K3 Gas exchange systems		K3 Health				K3 The skeletal & muscular systems	K3 Relationships in an ecosystem	K3 Relationships in an ecosystem	K3 Relationships in an ecosystem	K3 Relationships in an ecosystem	
AQA GCSE ref	4.4.2.1 Aerobic & anaerobic respiration	4.4.1.1 Photosynthetic reaction 4.4.1.2 Rate of photosynthesis	4.2.2.2 The heart & blood vessels	4.2.2.2 The heart & blood vessels 4.2.2.3 Blood	4.2.2.6 The effect of lifestyle on some non-communicable diseases	4.5.2.1 The human nervous system structure & function	4.3.1.6 Human defence systems	4.5.3.1 Human endocrine system 4.5.3.2 Control of blood glucose concentration		4.7.1.1 Communities 4.7.1.2 Abiotic factors 4.7.1.3 Biotic factors	4.7.2.1 Levels of organisation	4.7.2.1 Levels of organisation	4.7.2.1 Levels of organisation 4.7.3.2 Waste management	

Year 9 Main	Term 1 (until Christmas)			Term 2 (until Easter)		Term 3 (until Summer)		
	Cell Biology			Organisation				
Overview	Cells are the basic unit of all forms of life. Students will explore how structural differences between types of cells enables them to perform specific functions. Students will also learn how cells must divide to produce two new identical cells. If cells are isolated at an early stage of growth before they have become too specialised, they can retain their ability to grow into a range of different types of cells. This phenomenon has led to the development of stem cell technology & students will develop their knowledge of this during the topic. It is a new branch of medicine that allows doctors to repair damaged organs by growing new tissue from stem cells.			Students will learn about the human digestive system and the respiratory system. Both systems provide dissolved materials that need to be moved quickly around the body in the blood by the circulatory system. Damage to any of these three systems can be debilitating if not fatal. Huge progress in surgical techniques, especially with regard to coronary heart disease has been made. Student will learn that many interventions would not be necessary if individuals reduced their risks through improved diet and lifestyle. They will also learn how the plant's transport system is dependent on environmental conditions to ensure photosynthesis.				
End point	Be able to explain how the main sub-cellular structures of prokaryotic & eukaryotic cells are related to their functions Be able to explain how the structure of different types of cell relate to their function Be able to describe how to prepare an uncontaminated culture using aseptic technique	Be able to understand how microscopes & microscope techniques have developed over time Be able to carry out calculations involving magnification, real size and image size Be able to use a light microscope to observe, draw and label a selection of plant and animal cells	Be able to understand the cell cycle & recognise & describe situations where it is occurring Be able to describe the function of stem cells in embryos, in adult animals and in the meristems in plant	Be able to describe how substances are transported into and out of cells by diffusion, osmosis and active transport Be able to explain the differences between the three processes Be able to explain the need for exchange surfaces & a transport system in multicellular organisms	Be able to describe the structure & function of the digestive system, including the nature of enzyme molecules, the site of production of each enzyme & relate their activity to temperature & pH changes Be able to use qualitative reagents to test for a range of carbohydrates, lipids, & proteins	Know the structure & function of the human heart, blood vessels & the blood Be able to describe the relationship between health & disease & evaluate the advantages & disadvantages of treating cardiovascular disease by drugs, mechanical devices or transplant	Know the structure & function of the human respiratory system, including how the lungs are adapted for gaseous exchange	Be able to explain how the structure of root hair cells, xylem & phloem are adapted to their functions Be able to explain the effect of changing temperature, humidity, air movement & light intensity on the rate of transpiration
Knowledge & Skills	State & describe the function of the cell organelles in a plant cell & an animal cell Compare the cell organelles in a plant cell & an animal cell State examples of prokaryotic cells & eukaryotic cells Describe the structure of a prokaryotic cell Compare the structure of a prokaryotic & a eukaryotic cell Define the term aseptic technique Describe & explain the steps of aseptic technique	Label a microscope Describe how to use a microscope Compare a light microscope with an electron microscope State the magnification equation Apply the magnification equation Rearrange & then use the magnification equation	Define mitosis Describe the cell cycle Explain the cell cycle State different types of stem cell (in plants & animals) Describe what a stem cell is & evaluate the uses of stem cells Define therapeutic cloning & evaluate its uses	State substances moved by diffusion, osmosis & active transport Describe the processes of diffusion, osmosis & active transport Explain factors that can alter the rate of diffusion & osmosis Use the concept of osmosis to explain change in mass Compare all 3 methods of transport Explain how the small intestine & the lungs in mammals, gills in fish & the roots & leaves in plants are adapted for exchanging materials	Name & label organs in the digestive system Name enzymes, where they are produced & their function Link the digestive organs to their functions Use the lock & key model to explain why enzymes are specific Explain the effects of temperature & pH on enzyme activity Describe & carry out the chemical tests for carbohydrates, lipids & proteins	Describe & label the structure of the heart Identify the 3 types of blood vessel Describe & compare the structure of the 3 types of blood vessel State the parts of the blood & describe the function of each part Describe how stents, heart transplants & replacement heart valves work Evaluate the advantages & disadvantages of using stents, heart transplants & replacement heart valves in the treatment of CHD	Label a diagram of the respiratory system & state the function of the structures Describe diffusion Explain how the alveoli are adapted for efficient gaseous exchange Explain how emphysema damages the alveoli & how this can affect gaseous exchange	Describe the structure of the cross section of a leaf Recall the differences between transpiration & translocation Describe the function of the tissues in a plant & how they are adapted for photosynthesis Compare & contrast the structure & function of xylem & phloem Calculate the rate of transpiration Explain the factors that can alter the rate of transpiration
Knowledge organisers	Cell Biology			Organisation				
Assessment	Knowledge Step Checks and End of Topic assessments which build in content throughout the year							
Reading Opportunities	Stem cells - recent developments			The treatment of cardiovascular disease using transplants - opinions from both sides of the argument				
Writing Opportunities	Long answer Qs - writing a method for aseptic technique, evaluating the use of stem cells, writing a method to prepare & view a microscope slide			Long answer Qs - evaluating the use of the different methods to treat cardiovascular disease, planning an investigation into the effect of temperature on the rate of transpiration, planning an investigation into the effect of temperature on the effect of enzyme activity				
Vocabulary focus	prokaryotic, eukaryotic, plant, animal, bacteria, nucleus, genes, cell wall, cell membrane, cytoplasm, vacuole, chloroplast, chlorophyll, mitochondria, ribosome, flagellum, aseptic, transfer, inoculating loop, microorganisms, petri dish, culture, sterilise	microscope, light, electron, resolution, magnification, image, actual, objective lens, stage, base, arm, eyepiece	mitosis, growth, identical, DNA, chromosomes, replicate, duplicate, cytoplasm, cell membrane, stem cells, differentiation, bone marrow, meristem, embryo, diabetes, paralysis, therapeutic cloning	diffusion, osmosis, active transport, passive, energy, concentration, partially permeable cell membrane, surface area, concentration gradient, respiration, dilute, concentrated	mouth, salivary glands, teeth, oesophagus, stomach, bile, hydrochloric acid, small intestine, large intestine, anus, pancreas, gall bladder, amylase, protease, lipase, fats, lipids, carbohydrates, sugar, protein, amino acids, fatty acids & glycerol, starch, biuret, benedict's, iodine	heart, muscle, atrium, ventricle, valves, aorta, vena cava, pulmonary artery, pulmonary vein, capillary, lumen, elastic, pressure, red blood cells, white blood cells, plasma, platelets, stent, transplant, cholesterol, mechanical valves	trachea, bronchus, bronchioles, alveoli, capillaries, oxygen, carbon dioxide, surface area, concentration gradient, emphysema	root hair cells, xylem, phloem, transpiration, translocation, water, minerals, dissolved sugars, elongated, pores, lignin, temperature, light intensity, humidity
NC benchmarks								
AQA GCSE ref	4.1.1.1 Eukaryotes & Prokaryotes 4.1.1.2 Animal & Plant cells 4.1.1.3 Cell specialisation 4.1.1.4 Cell differentiation 4.1.1.6 Culturing microorganisms (Biology only)	4.1.1.2 Animal & Plant cells 4.1.1.5 Microscopy	4.1.2.1 Chromosomes 4.1.2.2 Mitosis & the cell cycle 4.1.2.3 Stem cells	4.1.3.1 Diffusion 4.1.3.2 Osmosis 4.1.3.3 Active transport	4.2.2.1 The human digestive system	4.2.2.2 The heart & blood vessels 4.2.2.3 Blood 4.2.2.4 Coronary heart disease 4.2.2.5 Health issues	4.2.2.2 The heart & blood vessels 4.1.3.1 Diffusion	4.2.3.2 Plant organ systems

Year 10 Main	Term 1 (until Christmas)				Term 2 (until Easter)				Term 3 (until Summer)					
	Infection & Response				Bioenergetics				Homeostasis					
Overview	<p>In this topic, students will develop their understanding of pathogens & the infectious diseases they can cause in animals and plants. Students will explore how we can avoid diseases by reducing contact with them, as well as how the body uses barriers against pathogens. Once inside the body our immune system is triggered which is usually strong enough to destroy the pathogen and prevent disease. When at risk from unusual or dangerous diseases our body's natural system can be enhanced by the use of vaccination. Students will develop an understanding of how a vaccination works & the range of antibiotics that have been developed which have proved successful against a number of lethal diseases caused by bacteria. They will develop an understanding of how many groups of bacteria have now become resistant to these antibiotics.</p>				<p>In this section students will explore how plants harness the Sun's energy in photosynthesis in order to make food. This process liberates oxygen which has built up over millions of years in the Earth's atmosphere. Both animals and plants use this oxygen to oxidise food in a process called aerobic respiration which transfers the energy that the organism needs to perform its functions. Conversely, anaerobic respiration does not require oxygen to transfer energy. During vigorous exercise the human body is unable to supply the cells with sufficient oxygen and it switches to anaerobic respiration. This process will supply energy but also cause the buildup of lactic acid in muscles which causes fatigue.</p>				<p>Cells in the body can only survive within narrow physical and chemical limits. They require a constant temperature and pH as well as a constant supply of dissolved food and water. In order to do this the body requires control systems that constantly monitor and adjust the composition of the blood and tissues. These control systems include receptors which sense changes and effectors that bring about changes. In this section students will explore the structure and function of the nervous system and how it can bring about fast responses. They will also explore the hormonal system which usually brings about much slower changes. Hormonal coordination is particularly important in reproduction since it controls the menstrual cycle.</p>					
End point	<p>Be able to explain how diseases caused by viruses, bacteria, protozoa & fungi are spread in animals & plants, how the spread can be reduced & symptoms of the diseases</p>	<p>Be able to describe the non-specific defence systems of the human body against pathogens & the role of the immune system in the defence against disease</p>	<p>Be able to explain how vaccination will prevent disease in an individual & how the spread of pathogens can be reduced by introducing a large proportion of the population</p>	<p>Be able to explain the use of antibiotics & other medicines in treating disease</p> <p>Be able to describe the process of discovery & development of potential new medicines, including pre-clinical & clinical testing</p>	<p>Be able to describe photosynthesis as an endothermic reaction in which energy is transferred from the environment to the photosynthetic light</p>	<p>Be able to compare the processes of aerobic & anaerobic respiration with regard to the need for oxygen, the differing products & the relative amounts of energy transferred</p>	<p>Be able to explain the human body's response to exercise</p> <p>Be able to explain the importance of sugars, amino acids, fatty acids & glycerol in the synthesis & breakdown of carbohydrates, proteins & lipids</p>	<p>Be able to explain that homeostasis is the regulation of the internal conditions of a cell or organism to maintain optimum conditions for function in response to external & internal changes</p>	<p>Be able to identify the cerebral cortex, cerebellum & medulla on the diagram of the brain & describe their function</p>	<p>Be able to describe how body temperature is monitored & controlled & explain how processes lower or raise body temperature in a given context</p>	<p>Be able to describe the effect on cells of osmotic changes in body fluids</p>	<p>Be able to describe the roles of hormones in human reproduction, including the menstrual cycle</p>	<p>Be able to describe the hormones that coordinate & control growth in a plant</p>	
Knowledge & Skills	<p>State that bacteria create toxins that cause disease</p> <p>State that viruses invade the host's cells, use the resources, then destroy the cell</p> <p>State that fungi & protozoa also cause disease</p> <p>Give examples of how the human body prevents pathogens from entering</p> <p>State that white blood cells are part of our immune system</p> <p>Describe how white blood cells function including the idea of phagocytosis, antibodies & anti toxins</p> <p>Explain how immunity occurs</p> <p>Describe the difference between antibiotics & painkillers</p>	<p>State what is in a vaccine</p> <p>State some diseases that vaccines protect against</p> <p>Describe the response of the body to a vaccine (including the idea of antigens)</p> <p>Describe the benefits & concerns of vaccination</p> <p>Describe the herd effect</p> <p>Compare antibody production after vaccination & after infection</p>	<p>State the word equation for photosynthesis</p> <p>State the symbol equation for photosynthesis</p> <p>Explain why photosynthesis is an endothermic reaction</p> <p>State the uses of the glucose produced</p> <p>State the factors that can affect the rate of photosynthesis</p> <p>Describe how photosynthesis can be measured</p> <p>Measure & calculate the rate of photosynthesis</p> <p>Suggest how to improve methods of measuring photosynthesis</p> <p>Interpret graphs of photosynthesis rate (limiting factors)</p> <p>Suggest how conditions in a greenhouse can be enhanced to achieve the maximum rate of photosynthesis</p>	<p>State the word equation for aerobic respiration</p> <p>State the symbol equation for aerobic respiration</p> <p>State the word equation for anaerobic respiration in muscle cells</p> <p>State the word equation for anaerobic respiration in yeast cells</p> <p>State the symbol equation for anaerobic respiration in muscle cells</p> <p>Explain why respiration is an exothermic process</p> <p>Compare aerobic & anaerobic respiration including the need for oxygen, the differing products & the relative amounts of energy transferred</p>	<p>State changes to the body due to exercise</p> <p>Explain why breathing rate & heart rate increase during exercise</p> <p>Explain the idea of oxygen debt</p> <p>Define the term metabolism</p> <p>State examples of metabolism</p>	<p>State the definition of homeostasis, giving examples</p> <p>Label a diagram of a reflex arc</p> <p>Describe what happens during a reflex arc</p> <p>Explain how the structures in a reflex arc are adapted to their function</p>	<p>Describe the structure & function of the brain (cerebral cortex, cerebellum, medulla)</p> <p>Explain some of the difficulties of investigating brain function</p> <p>Explain some of the limitations in treating damage & disease of the brain</p> <p>Label a diagram of the eye</p> <p>Explain how the structures of the eye are related to their function</p> <p>Describe common defects of the eye & explain how some of these problems can be overcome</p>	<p>State how body temperature is monitored by the body</p> <p>Describe & explain the function of the skin as the control of body temperature</p> <p>Explain how the mechanisms of controlling body temperature can lower or raise body temperature</p> <p>Compare type 1 & type 2 diabetes & explain how they can be treated</p>	<p>Identify the position of different glands on a human body diagram & name the glands</p> <p>Describe the role of the endocrine system</p> <p>Identify the hormones secreted by each gland & outline their function</p> <p>State the hormones involved in the control of blood glucose & the organ that secretes them</p> <p>Explain how insulin controls blood glucose levels in the body</p> <p>Explain how glucagon interacts with insulin to control blood glucose levels in the body</p> <p>Compare type 1 & type 2 diabetes & explain how they can be treated</p>	<p>Describe how water is gained & lost from the body each day</p> <p>Describe the function of the kidneys in maintaining the water balance of the body including the importance of osmotic control</p> <p>Describe the effect of ADH on the permeability of the kidney tubules</p> <p>Explain the advantages & disadvantages of treating organ failure by mechanical device or transplant</p>	<p>Describe the roles of hormones in human reproduction, including the menstrual cycle</p> <p>Explain the interactions of FSH, LH, oestrogen & progesterone in the control of the menstrual cycle</p> <p>Explain the role of hormones in contraception & evaluate hormonal & non-hormonal methods of contraception</p> <p>Explain the use of hormones in modern reproductive technologies to treat infertility</p>	<p>State the hormones involved in the growth of plants & describe their effects</p> <p>Give a description of the term 'photoperiod' & 'photoperiodism'</p> <p>Explain how plant hormones are important in the control & coordination of plant growth & development, with reference to the role of auxin in phototropism & geotropism</p>		
Knowledge organisers	Infection & Response				Bioenergetics				Homeostasis					
Assessment	Knowledge Step Checks and End of Topic assessments, which build in content throughout the year													
Reading Opportunities	When drugs trials go wrong. Vaccinations & the link to autism				Changes in heart rate for trained athletes, rate of photosynthesis in different types of plants				The effects of caffeine on the nervous system, Research into the brain & how we are developing our knowledge, Laser eye surgery (how does it work?)					
Writing Opportunities	Long answer Qs - describing how a drug does from being designed to being approved for public use, describing the functions of white blood cells, interpreting graphical data about vaccinations & drawing conclusions				Long answer Qs - writing a method to investigate photosynthesis, writing a method to investigate the effects of exercise on heart rate, comparing aerobic & anaerobic respiration				Long answer Qs - planning a valid investigation into the effects of tiredness on reaction time. Explaining how blood glucose concentration is controlled. Explaining how body temperature is controlled. Explaining how water levels are controlled within the body					
Vocabulary focus	<p>bacteria, virus, fungus, protozoa, toxins, host, salmonella, gonorrhoea, TBV, measles, rose black spot, malaria, fever, red rash, HIV, immune system, mosaic, photosynthesis, vomit, diarrhoea, discharge, pain vector</p>	<p>skin, nose, trachea, bronchi, stomach, hydrochloric acid, phagocytosis, antibody, antihistamine, viral, digest, immunity, memory cell</p>	<p>vaccination, dead, inactive, pathogen, white blood cells, antibodies, response, herd effect, measles, mumps, rubella</p>	<p>digitalis, fenofibrate, aspirin, xifex, penicillin, mould, synthesised, tacrolimus, efficacy, dose, pre-clinical, clinical, placebo, blind trial, double blind trial, bias</p>	<p>carbon dioxide, water, light, chlorophyll, chloroplasts, root hair cells, oxygen, glucose, byproduct, endothermic, rate, bubbles, limiting factor, cellulose, protein synthesis, starch, insoluble, respiration</p>	<p>aerobic, anaerobic, respiration, energy, oxygen, glucose, carbon dioxide, water, exothermic, yeast, fermentation, lactic acid, ethanol, bread, alcohol</p>	<p>heart rate, breath volume, oxygenated, blood, insufficient, aerobic, anaerobic, respiration, oxygen debt, lactic acid, metabolism</p>	<p>homeostasis, regulation, internal, external, receptors, neurons, sensory, motor, reflex, CNS, effectors, glands, muscles, brain, automatic, conscious</p>	<p>brain, cerebral cortex, cerebellum, medulla, MRI, accommodation, retina, optic nerve, sclera, cornea, iris, ciliary muscles, ciliary apparatus, contract, relax, sphincter, tension, myopia, hyperopia, refract</p>	<p>thermoregulatory centre, brain, receptors, blood, skin, diaph, vasodilation, constriction, vasoconstriction, sweat, shiver, respiration</p>	<p>endocrine, hormones, glands, pituitary, pancreas, thyroid, adrenal, ovary, testes, PTH, adrenaline, oestrogen, progesterone, testosterone, insulin, glucagon, glucose, diabetes, hypodensity, negative feedback</p>	<p>osmotic, water, kidney, lung, skin, amino acids, deamination, ammonia, toxic, filtration, ADH, pituitary gland, permeability, dialysis</p>	<p>puberty, oestrogen, testosterone, follicle stimulating hormone (FSH), luteinising hormone (LH), progesterone, pituitary gland, ovary, contraception, hormonal, non-hormonal, in vitro fertilisation (IVF), fertility</p>	<p>phototropism, geotropism, gravitropism, gibberellins, ethene</p>
NC benchmarks														
AQA GCSE ref	<p>4.3.1.1 Communicable diseases 4.3.1.2 Viral diseases 4.3.1.3 Bacterial diseases 4.3.1.4 Fungal diseases 4.3.1.5 Toxic diseases</p>	<p>4.3.1.6 Human defence systems</p>	<p>4.3.1.7 Vaccinations</p>	<p>4.3.1.8 Antibiotics & Painkillers 4.3.1.9 Discovery & development of drugs</p>	<p>4.4.2.1 Aerobic & anaerobic respiration</p>	<p>4.4.2.2 Response to exercise 4.4.2.3 Metabolism</p>	<p>4.5.1 Homeostasis 4.5.2.1 The nervous system (structure & function) 4.5.2.2 The eye (Biology only) 4.5.2.3 The eye (Biology only)</p>	<p>4.5.3.1 Human endocrine system 4.5.3.2 Control of blood glucose concentration 4.5.3.3 Maintaining water & nitrogen balance in the body (Biology only)</p>	<p>4.5.3.4 Hormones in human reproduction 4.5.3.5 Contraception 4.5.3.6 The use of hormones to treat infertility</p>	<p>4.5.4.1 Control & coordination (Biology only)</p>				

