Thomas More Catholic Academy
FAITH | EXCELLENCE | RESPECT

Biology Curriculum Sequence – Key Stage 3

	KS2 National Curriculum prior learning	By the end of the term, students can:	Year 7 Term 1 Food testing Investigation	Year 7 Term 2 - Organisms	Year 7 Term 3b - Genes	Year 8 Term 1 - Organisms	Year 8 Term 2 - Ecosystems	Year 8 Term 3 – Ecosystems and Plant Reproduction	Year 9 Term 1 and 2a - Organisms	Year 9 Term 2b - Ecosystems	Year 9 Term 3b - Genes
What we want our students to know and remember	The principal focus in KS3 is to develop a deeper understanding of a range of scientific ideas. Pupils should begin to see the connections between these subject areas and become aware of some of the big ideas underpinning scientific knowledge and understanding. Examples of these big ideas in Biology are; Organisms (Skeletons, muscles, Digestive System, nutrition), Ecosystems (Habitats, food chains, pollination, seed formation and dispersal, transport of water in plants, resources needed to survive, plants, conditions needed for plant growth) and Genes (comparing living things, animals and offspring, parts of flowering plants and reproduction). They should be encouraged to relate scientific explanations to phenomena in the	Define the key tier 3 **vocabulary**:	Control variable: One that remains unchanged or is held constant to stop it affecting the dependent variable Dependent variable: What you measure or observe in an investigation Hazard: A situation that presents a threat to people Hypothesis: An explanation you can test which includes a reason and a 'science idea Independent variable: What you change in an investigation to see how it affects the dependent variable Observation: Information gathered by your senses Peer reviewed: The checking of research by other scientists Prediction: What you think will happen in an experiment Risk: How likely something is to be harmful Scientific enquiries: Different ways to investigate	Cell: The unit of a living organism, contains parts to carry out life processes Cell membrane: Surrounds the cell and controls movement of substances in and out Cell wall: Strengthens the cell. In plant cells it is made of cellulose Diffusion: One way for substances to move into and out of cells Mitochondria: Part of the cell where energy is released from food molecule Multi-cellular: Living things made up of many types of cell Nucleus: Contains genetic material (DNA) which controls the cell's activities Organ: Group of different tissues working together to carry out a job Structural adaptations: Special features to help a cell carry out its functions Tissue: Group of cells of one type Uni-cellular: Living things made up of	Amniotic fluid: Liquid that surrounds and protects the foetus Fertilisation: Joining of a nucleus from a male and female sex cell Foetus: The developing baby during pregnancy Gamete: The male gamete (sex cell) in animals is a sperm, the female an egg Gestation: Process where the baby develops during pregnancy Menstruation: Loss of the lining of the uterus during the menstrual cycle Ovary: Organ which contains eggs Oviduct, or fallopian tube: Carries an egg from the ovary to the uterus and is where fertilisation occurs Ovulation: Release of an egg cell during the menstrual cycle, which may be met by a sperm Penis: Organ which carries sperm out of the male's body Placenta: Organ	Alveoli: Small air sacs found at the end of each bronchiole Breathing: The movement of air in and out of the lungs Bronchi: Two tubes which carry air to the lungs Bronchioles: Small tubes in the lung Diaphragm: A sheet of muscle found underneath the lungs Lung volume: Measure of the amount of air breathed in or out Ribs: Bones which surround the lungs to form the ribcage Trachea (windpipe): Carries air from the mouth and nose to the lungs	Food web: Shows how food chains in an ecosystem are linked. Food chain: Part of a food web, starting with a producer, ending with a top predator. Ecosystem: The living things in a given area and their non-living environment. Environment: The surrounding air, water and soil where an organism lives. Population: Group of the same species living in an area. Producer: Green plant or algae that makes its own food using sunlight. Consumer: Animal that eats other animals or plants. Decomposer: Organism that breaks down dead plant and animal material so nutrients can be recycled back to the soil or water.	Pollen: Contains the plant male sex cells found on the stamens. Ovules: Female sex cells in plants found in the ovary. Pollination: Transfer of pollen from the male part of the flower to the female part of the flower on the same or another plant. Fertilisation: Joining of a nucleus from a male and female sex cell. Seed: Structure that contains the embryo of a new plant. Fruit: Structure that the ovary becomes after fertilisation, which contains seeds. Carpel: The female part of the flower, made up of the stigma where the pollen lands, style and ovary.	Digestive system (the system involved in the digestion of food), Digestion (breaking down large insoluble molecules into smaller soluble molecules), Enzymes (catalysts which speed up chemical reactions - they help to speed up the breaking down of food molecules) Heart - an organ that pumps blood around the body, part of the circulatory system 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 Organ Systems - a group of organs working together Tissue (group of cells working together), organ (different tissues working together), organ system (different organs working together)	Photosynthesis - the chemical reaction by which plants make food Respiration - the chemical reaction which releases energy	Adaptations are features that organisms have which help them to survive Decomposition is the breaking down of dead material Evolution is the idea that all living things developed from simple organisms Fossils are the remains of organisms from millions of years ago Gametes are sex cells Natural Selection is a theory which helps to explain Evolution Organisms compete for resources they need to survive Selective breeding involves selecting the organisms we want to breed together Sexual reproduction involves the fusion of egg and sperm

	world around them and start to use modelling and abstract ideas to develop and evaluate explanations.		including observation over time, fair test and pattern seeking Variable: A factor that can be changed, measured and controlled	one cell Vacuole: Area in a cell that contains liquid, and can be used by plants to keep the cell rigid and store substances.	that provides the foetus with oxygen and nutrients and removes waste substances Reproductive system: All the male and female organs involved in reproduction Testicle: Organ where sperm are produced Uterus, or womb: Where a baby develops in a pregnant woman Umbilical cord: Connects the foetus to the placenta Vagina: Where the penis enters the female's body and sperm is received						
			Year 7 Term 1 - Organisms	**Year 7 term 2b and 3a - Genes**		**Year 8 Term 1- Organisms**			**Year 9 Term 2a - Organisms**	**Year 9 Term 3a Organisms and Genes**	
			Antagonistic muscle pair: Muscles working in unison to create movement Bone marrow: Tissue found inside some bones where new blood cells are made Cartilage: Smooth tissue found at the end of bones, which reduces friction between them Joints: Places where bones meet Ligaments: Connect bones in joints Muscular skeletal system: Muscles and bones working together to cause movement and support the body	Continuous variation: Where differences between living things can have any numerical value Discontinuous variation: Where differences between living things can only be grouped into categories Species: A group of living things that have more in common with each other than with other groups Variation: The differences within and between species		Carbohydrates: The body's main source of energy. There are two types: simple (sugars) and complex (starch) Dietary fibre: Parts of plants that cannot be digested, which helps the body eliminate waste Enzymes: Substances that speed up the chemical reactions of digestion Gut bacteria: Microorganisms that naturally live in the intestine and help food break down Large intestine: Lower part of the intestine from which water is			Antibody - Small chemicals made by some white blood cells. They attach to microbes and help to destroy them Disease - When some processes that happen in the body do not work in the way they should Engulf - When a white blood cell completely surrounds a microbe and destroys it, it is said to engulf the microbe Immunisation - Making people immune to diseases Infect - When a microbe gets into your body you are	External fertilisation - When fertilisation happens outside the bodies of the parents Fertility - the ability to reproduce Hormones - chemicals which can cause changes Reaction Time - the time taken to react	

			Tendons: Connect muscles to bones			absorbed and where faeces are formed Lipids (fats and oils): A source of energy. Found in butter, milk, eggs, nuts Protein: Nutrient your body uses to build new tissue for growth and repair. Sources are meat, fish, eggs, dairy products, beans, nuts and seeds Small intestine: Upper part of the intestine where digestion is completed and nutrients are absorbed by the blood Stomach: A sac where food is mixed with acidic juices to start the digestion of protein and kill microorganisms			'infected' by it Infection - A disease that can be spread from person to person or from animal to person is infectious Medicines - A drug that helps the body to ease the symptoms of a disease or cure the disease Microbes - very small living organism Symptoms - The effects that a disease has on your body Vaccination - A mixture containing microbes which normally cause disease, which have been treated so that they don't. Injected into people to make them immune Virus - The smallest type of microbe. Many people think that they are not living because they do not carry out the seven life processes for themselves White Blood Cell - A type of blood cell which helps to destroy microbes. They either engulf microbes or make antibodies		

		Year 7 Term 1 Food testing Investigation	Year 7 Term 2 - Organisms	Year 7 Term 3b – Genes	Year 8 Term 1 - Organisms	Year 8 Term 2 – Ecosystems	Year 8 Term 3 – Ecosystems and Plant Reproduction	Year 9 Term 1 and 2a - Organisms	Year 9 Term 2b - Ecosystems	Year 9 Term 3b - Genes
Recall the **knowledge**:		Humans require a balanced diet, which consists of all the correct nutrients in the right proportions. Carbohydrates are needed for energy, protein is needed for growth and repair, fat is needed for insulation and energy. Vitamins and minerals are needed for a healthy body. We can use a variety of experiments to test which nutrients are present in the typical food we might eat.	All living things are made out of cells. There are many types of cell. Each has a different structure or feature so it can do a specific job Both plant and animal cells have a cell membrane, nucleus, cytoplasm and mitochondria Plant cells also have a cell wall, chloroplasts and usually a permanent vacuole Multicellular organisms are composed of cells which are organised into tissues, organs and systems to carry out life processes Chloroplast: Absorbs light energy so the plant can make food Cytoplasm: Jelly-like substance where most chemical processes happen A group of similar cells form a tissue, a group of tissues working together form organs and a group of organs working together form organ systems Immune system: Protects the body against infections Reproductive system: Produces	The menstrual cycle prepares the female for pregnancy and stops if the egg is fertilised by a sperm The developing foetus relies on the mother to provide it with oxygen and nutrients, to remove waste and protect it against harmful substances The menstrual cycle lasts approximately 28 days If an egg is fertilised it settles into the uterus lining	In gas exchange, oxygen and carbon dioxide move between alveoli and the blood Oxygen is transported to cells for aerobic respiration and carbon dioxide, a waste product of respiration, is removed from the body Breathing occurs through the action of muscles in the ribcage and diaphragm The amount of oxygen required by body cells determines the rate of breathing	Organisms in a food web (decomposers, producers and consumers) depend on each other for nutrients. So, a change in one population leads to changes in others. The population of a species is affected by the number of its predators and prey, disease, pollution and competition between individuals for limited resources such as water and nutrients.	Plants have adaptations to disperse seeds using wind, water or animals. Plants reproduce sexually to produce seeds, which are formed following fertilisation in the ovary.	Cells are the fundamental unit of living organisms Most human cells are like most other animal cells and have the following parts nucleus – controls the activities of the cells and contains the genetic material cytoplasm – where most chemical reactions take place cell membrane – controls the passage of substances in and out of cells Cells may be specialised to carry out a particular function, e.g. sperm cells, nerve cells and muscle cells A balanced diet consists of carbohydrates, lipids, proteins, vitamins, minerals, dietary fibre and water. Each component is needed for different reasons The hierarchical organisation of multicellular organisms; living things are made of cells, which form tissues, which form organs which form organ systems. The Digestive system is one of the organ systems and is used to	Plants make carbohydrates in their leaves by photosynthesis and gaining mineral nutrients and water from the soil via their roots The reactants in and products of photosynthesis can be represented as a word summary for photosynthesis Almost all life depends on the ability of photosynthetic organisms, such as plants and algae, to use sunlight in photosynthesis to build organic molecules that are an essential energy store and to maintain levels of oxygen and carbon dioxide in the atmosphere The rate of Photosynthesis can be measured in the lab and factors affecting the rate can be investigated Aerobic and anaerobic respiration in living organisms, including the breakdown of organic molecules enable all other chemical processes necessary for life Respiration can be written as a word summary The process of	The process by which genetic information is transmitted from one generation to the next is heredity There are difference between species and this is called variation The variation between species and between individuals of the same species means some organisms compete more successfully, which can drive natural selection Some organisms are selected to breed together as they have desirable features. This can cause health problems in the offspring of selective breeding (Sexual) reproduction in mammals involves the fertilisation of gametes Heredity is the process by which genetic information is passed from one generation to another. A simple model of chromosomes, genes and DNA can be used to predict the possible gender of offspring Extension - Genetic engineering involves

				sperm and eggs, and is where the foetus develops Digestive system: Breaks down and then absorbs food molecules Circulatory system: Transports substances around the body Respiratory system: Replaces oxygen and removes carbon dioxide from blood Muscular skeletal system: Muscles and bones working together to cause movement and support the body					break down large molecules of food into smaller molecules of food The tissues and organs of the human digestive system are adapted in order to maximise the digestion and absorption of food Enzymes are biological catalysts which help to break down food molecules The heart is part of the circulatory system and pumps blood around the body Our lifestyle can have a big impact on our health There are consequences of imbalances in the diet, including obesity, starvation and deficiency diseases Being fit means that your body can cope with the activities that you need to do. To stay fit you should eat a balanced diet, exercise regularly, avoid smoking and avoid alcohol and drug abuse. If you follow these rules your heart will stay healthy and you will be less likely to suffer from high blood pressure and other circulatory problems like heart disease (when heart muscle cells start to die)	anaerobic respiration in humans and microbes, including fermentation, can be written as a word summary	transferring one gene from one organism into the genetic material of another organism. This could be done for many reasons The variation between species and between individuals of the same species means some organisms compete more successfully. Organisms can have adaptations which enable them to compete for resources better than other organisms Organisms (such a humans) can affect, and are affected by, their environment, including the accumulation of toxic materials Humans are a growing population and they produce waste. This waste can contribute to many environmental issues. Therefore, their waste must be managed Interdependence of organisms in an ecosystem. Plants use carbon dioxide from the atmosphere for photosynthesis. They release carbon dioxide into the atmosphere by respiration (as do all living things) Extension to cycles - carbon is constantly cycled

												as is water (water cycle is also covered at KS2)
			Year 7 Term 1 - Organisms	**Year 7 term 2b and 3a - Genes**		**Year 8 Term 1- Organisms**			**Year 9 Term 2a - Organisms**	**Year 9 Term 3a Organisms and Genes**	
			The parts of the human skeleton work as a system for support, protection, movement and the production of new blood cells Antagonistic pairs of muscles create movement when one contracts and the other relaxes	There is variation between individuals of the same species Some variation is inherited, some is caused by the environment and some is a combination Variation between individuals is important for the survival of a species, helping it to avoid extinction in an always changing environment		The body needs a balanced diet with carbohydrates, lipids, proteins, vitamins, minerals, dietary fibre and water, for its cells' energy, growth and maintenance Organs of the digestive system are adapted to break large food molecules into small ones which can travel in the blood to cells and are used for life processes Iron is a mineral important for red blood cells Calcium is a mineral needed for strong teeth and bones Vitamins and minerals are needed in small amounts to keep the body healthy			Some Diseases are caused by microbes which can be transmitted from person to person Our immune system responds by destroying the microbes Medicines are drugs which are used to make us better Vaccinations are used to help reduce incidence of disease within a population	The body is controlled by both the nervous system (another organ system) and hormones The time taken for us to respond to something is called our reaction time Different factors can affect our reaction time Changes that happen during adolescence cause the reproductive organs to get bigger and start to make sex cells at puberty. This is a time when major physical changes occur in our bodies. These changes are caused by sex hormones Hormones are chemicals The menstrual cycle happens in females. It includes the loss of blood, the maturing of an egg, the build up of the lining of the uterus and the release of an egg Extension - Hormones are chemicals which help to control the menstrual cycle	
What we want our students to do	Pupils should understand that science is about	Demonstrate excellence in these **skills**:	**Year 7 Term 1 Food testing Investigation**	**Year 7 Term 2 - Organisms**	**Year 7 Term 3b - Genes**	**Year 8 Term 1 - Organisms**	**Year 8 Term 2 – Ecosystems**	**Year 8 Term 3 – Ecosystems and**	**Year 9 Term 1 and 2a - Organisms**	**Year 9 Term 2b - Ecosystems**	**Year 9 Term 3b - Genes**

	working objectively, modifying explanations to take account of new evidence and ideas and subjecting results to peer review. Pupils should decide on the appropriate type of scientific enquiry to undertake to answer their own questions and develop a deeper understanding of factors to be taken into account when collecting, recording and processing data. They should evaluate their results and identify further questions arising from them.								**Plant Reproduction**			
			Suggest a scientific reason for your findings Suggest other possible conclusions that could be drawn from your data Design a table for the data being gathered Write in a style to fit purpose and audience Use clear language and well formed sentences Read your text and rewrite anything that is not clear Illustrate ideas with real-life examples Use scientific vocabulary accurately, showing that you know its meaning and use appropriate units and correct chemical nomenclature Check there are no mistakes in spelling, punctuation or grammar. Record the observation you want to explain Record observations using scientific words Describe the evidence for your idea Prepare a table with space to record all measurements Carry out the method carefully and consistently Identify an observation that	Explain why multi-cellular organisms need organ systems to keep their cells alive Suggest what kind of tissue or organism a cell is part of, based on its features Explain how to use a microscope to identify and compare different types of cells Use a light microscope to observe and draw cells. Explain how uni-cellular organisms are adapted to carry out functions that in multi-cellular organisms are done by different types of cell	Explain whether substances are passed from the mother to the foetus or not Use a diagram to show stages in development of a foetus from the production of sex cells to birth Describe causes of low fertility in male and female reproductive systems Identify key events on a diagram of the menstrual cycle	Explain how exercise, smoking and asthma affect the gas exchange system Explain how the parts of the gas exchange system are adapted to their function Explain observations about changes to breathing rate and volume Explain how changes in volume and pressure inside the chest move gases in and out of the lungs	Describe how a species' population changes as its predator or prey population changes. Explain effects of environmental changes and toxic materials on a species' population. Combine food chains to form a food web. Explain issues with human food supplies in terms of insect pollinators.	Describe the main steps that take place when a plant reproduces successfully. Identify parts of the flower and link their structure to their function. Suggest how a plant carried out seed dispersal based on the features of its fruit or seed. Explain why seed dispersal is important to survival of the parent plant and its offspring.	Use scientific vocabulary correctly. Label a simple diagram of an animal cell Draw/label specialised animal cells showing their specific features and what they are used for. Correctly use a microscope to observe prepared slides Describe the functions of the cell wall, cell membrane, cytoplasm, nucleus, vacuole, mitochondria and chloroplasts Identify similarities and differences between plant and animal cells Students should be able, when provided with appropriate information, to explain how the structure of different types of cell relates to their function identify the components of a balanced diet Describe how organisms are organised Label a diagram of the digestive system Describe the role of each part of the digestive system Describe how the heart is part of the circulatory system and its role is to pumps blood around the body in a duel circulatory system	Represent photosynthesis as a word summary Describe the importance of photosynthesis Investigate the effect of light on the rate of photosynthesis Represent aerobic and anaerobic respiration as word summaries Compare aerobic and anaerobic respiration Suggest some uses of fermentation .	State what Evolution is State what fossils are and describe how they can be formed Explain how fossils are useful in explaining Evolution through Natural Selection Identify variation between individuals of the same species. Explain how the variation can cause some organisms to become more suited to their environment. Recall and apply the idea that such useful characteristics are passed from one generation to another to explain the theory of Natural Selection identify some desirable characteristics. Describe how organisms can be selected for such characteristics and bred together. Describe the process of selective breeding Recall the idea of fertilisation and how sexual reproduction gives rise to variation Compare sexual reproduction and asexual reproduction Recall heredity. Use punnett squares as a way to show how sex is determined and how predictions

			could be recorded or measured over time Identify a dependent variable Decide how to measure the dependent variable Select important control variables Identify how to control each control variable. Identify and record key features of an observation Write a scientific description of the observation, using key words. Decide whether the conclusion of the experiment agrees with your prediction. Identify features of an investigation which are hazardous Determine the nature of the hazard Suggest the likelihood of that happening Identify ways of reducing the hazard Identify ways of reducing the risk						Explain how our lifestyle can lead to the development of heart disease Draw a sketch showing the shape of the heart and the positions of blood vessels Observe differences in muscle between the right side and left side of the heart Explain how enzymes work; the names of them, what they break down, products of digestion and where each enzyme works Describe the effects of recreational drugs (including substance misuse) on behaviour, health and life processes Describe how our diet can impact our health (in particular when it is unbalanced)		about future offspring can be made Recall simple models of chromosomes and genes Extension - Describe the process of genetic engineering Extension - Evaluate the use of genetic engineering Identify variation between members of the same species and describe how characteristics might be advantageous to the organism Recall what organisms need in order to survive. Link this to useful characteristics and how organisms compete with each other for resources Suggest reasons for a growing population. Identify waste that humans produce. Suggest the affect of such waste on the environment Suggest and describe ways to manage waste Recall the water cycle from KS2 and link this with photosynthesis in plants. Discuss how water is constantly cycled Recall that plants need carbon dioxide for photosynthesis Extension - Describe how

												carbon is constantly cycled
			Year 7 Term 1 - Organisms	**Year 7 term 2b and 3a - Genes**		**Year 8 Term 1- Organisms**			**Year 9 Term 2a - Organisms**	**Year 9 Term 3a Organisms and Genes**	
			Explain how a physical property of part of the skeleton relates to its function Explain why some organs contain muscle tissue Explain how antagonistic muscles produce movement around a joint Use a diagram to predict the result of a muscle contraction or relaxation	Explain whether characteristics are inherited, environmental or both Plot bar charts or line graphs to show discontinuous or continuous variation data Explain how variation helps a particular species in a changing environment Explain how characteristics of a species are adapted to particular environmental conditions		Describe possible health effects of unbalanced diets from data provided Calculate food requirements for a healthy diet, using information provided Describe how organs and tissues involved in digestion are adapted for their role Describe the events that take place in order to turn a meal into simple food molecules inside a cell			Describe how microbes which cause disease can be spread from person to person and how the immune system works to protect us from such microbes Describe how vaccinations work and how they can help to reduce the number of people suffering the symptoms of a disease	Investigate how our reaction time is effected by practise (other independent variables could be tested e.g. caffeine) Draw a table for result. Record results in the table. Draw a graph and identify any patterns. Draw conclusions given the results obtained Describe the changes that happen during adolescence and that the reproductive organs get bigger and start to make sex cells at puberty. This is a time when major physical changes occur in our bodies. These changes are caused by sex hormones Describe the different stages of the menstrual cycle	
Key assessment questions:			**Year 7 Term 1 Food testing Investigation**	**Year 7 Term 2 - Organisms**	**Year 7 Term 3b - Genes**	**Year 8 Term 1 - Organisms**	**Year 8 Term 2 - Ecosystems**	**Year 8 Term 3 - Genes**	**Year 9 Term 1 and 2a - Organisms**	**Year 9 Term 2b - Ecosystems**	**Year 9 Term 3b - Genes**

			Make a conclusion and explain it Judge whether the conclusion is supported by the data Explain why an explanation is more believable when supported by data from an experiment Explain which type of enquiry is best for answering a given scientific question Explain whether a given question can be investigated scientifically Describe how controlling variables is important in providing evidence for a conclusion Describe what to do if the conclusion does not agree with your prediction Identify potential sources of random and systematic error	Make deductions about how medical treatments work based on cells, tissues, organs and systems Suggest how damage to, or failure of, an organ would affect other body systems Deduce general patterns about how the structure of different cells is related to their function Find out how recreational drugs might affect different body systems	Explain why pregnancy is more or less likely at certain stages of the menstrual cycle Make deductions about how contraception and fertility treatments work Predict the effect of cigarettes, alcohol or drugs on the developing foetus	Evaluate a possible treatment for a lung disease Predict how a change in the gas exchange system could affect other processes in the body Evaluate a model for showing the mechanism of breathing	Suggest what might happen when an unfamiliar species is introduced into a food web. Develop an argument about how toxic substances can accumulate in human food. Make a deduction based on data about what caused a change in the population of a species.	Describe similarities and differences between the structures of wind pollinated and insect pollinated plants. Suggest how plant breeders use knowledge of pollination to carry out selective breeding. Develop an argument why a particular plant structure increases the likelihood of successful production of offspring.	Compare plant and animal cells Describe the roles of the organelles found in most cells Describe how some cells are specialised for their function (identify their function, along with the features they would have to help them to do their role) Describe the digestion of carbohydrates/protein/lipids Identify ways that our lifestyle can impact our health Explain the consequences of a poor diet	Suggest what might happen to animals and the atmosphere if more trees are cut down Suggest what happens when we do vigorous exercise Compare aerobic and anaerobic respiration	Predict how humans might evolve Discuss the importance of fossils in providing evidence for Natural Selection and Evolution Use a punnett square to show the possible outcome for the gender of offspring Compare sexual and asexual reproduction. Challenge - identify advantages and disadvantages of each Evaluate the use of genetic engineering Discuss problems associated with genetic engineering If organisms cannot compete well for resources, suggest what might happen Draw the carbon cycle and water cycle as two flow diagrams
			Year 7 Term 1 - Organisms	**Year 7 term 2b and 3a - Genes**		**Year 8 Term 1- Organisms**			**Year 9 Term 2a - Organisms**	**Year 9 Term 3a Organisms and Genes**	

			Predict the consequences of damage to a joint, bone or muscle Suggest factors that affect the force exerted by different muscles Consider the benefits and risks of a technology for improving human movement	Predict implications of a change in the environment on a population Use the ideas of variation to explain why one species may adapt better than another to environmental change Critique a claim that a particular characteristic is inherited or environmental		Design a diet for a person with specific dietary needs Critique claims for a food product or diet by analysing nutritional information Make deductions from medical symptoms showing problems with the digestive system			Suggest how to prevent microbes from spreading from one person to another Science Capital opportunity - Suggest the importance of the COVID 19 vaccine rollout	Suggest factors which might affect reaction time Write a method to investigate reaction time, with a different independent variable	
Disciplinary Rigour		What makes your subject different to other subjects? What are the expectations for students in your subject area in the KS3 National Curriculum?	**Year 7 Term 1 Food testing Investigation**	**Year 7 Term 2 - Organisms**	**Year 7 Term 3b - Genes**	**Year 8 Term 1 - Organisms**	**Year 8 Term 2 - Ecosystems**	**Year 8 Term 3 – Ecosystems and Plant Reproduction**	**Year 9 Term 1 and 2a - Organisms**	**Year 9 Term 2b - Ecosystems**	**Year 9 Term 3b - Genes**
			Devise questions, Estimate risks, Collect data, Analyse information	Communicate ideas Construct explanations	Communicate ideas Construct explanations Critique claims Justify opinions Examine consequences Review theories Interrogate sources	Analyse patterns Discuss limitations Draw conclusions Present data Communicate ideas Construct explanations Critique claims Justify opinions Plan variables Test hypothesis Interrogate sources	Analyse patterns Draw conclusions Present data Communicate ideas Devise questions Examine consequences	Draw conclusions Communicate ideas Construct explanations Critique claims Justify opinions Review theories	Draw conclusions Communicate ideas Construct explanations Critique claims Justify opinions Review theories	Analyse patterns Draw conclusions Present data Communicate ideas Construct explanations Collect data Devise questions Plan variables Test hypothesis Examine consequences	Construct explanations Critique claims Justify opinions Review theories Interrogate sources
			Year 7 Term 1 - Organisms	**Year 7 term 2b and 3a - Genes**		**Year 8 Term 1- Organisms**	**Year 8 Term 2 Ecosystems**	**Year 8 Term 3 – Ecosystems and Plant Reproduction**	**Year 9 Term 2a - Organisms**	**Year 9 Term 3a Organisms and Genes**	
			Analyse patterns Discuss limitations Draw conclusions Present data Communicate ideas Critique claims Justify opinions	Analyse patterns Discuss limitations Draw conclusions Present data Critique claims Justify opinions Examine consequences Review theories Interrogate sources		Communicate ideas Construct explanations Critique claims Justify opinions Test hypothesis	Draw conclusions Present data Communicate ideas Construct explanations Devise questions.	Draw conclusions Communicate ideas Critique claims Justify opinions	Draw conclusions Communicate ideas Construct explanations Critique claims Justify opinions Review theories	Analyse patterns Draw conclusions Present data Communicate ideas Construct explanations Collect data Devise questions Plan variables Test hypothesis Examine consequences	