

Curriculum Subject: Science KS3

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
YEAR 7 (on rotation)	Safety in the Science Lab & Particles (all classes)	Cells and Reproduction*	Forces and the Universe*	Eco Systems**	Chemical Reactions**	Heating and Energy**
	<ul style="list-style-type: none"> • Safety rules of a science lab • properties of solids, liquids and gases based on the arrangement /movement of their particles. • Explain changes in states in terms of changes to the energy of particles. • Explain dissolving, filtering & evaporation using particle model. • Use chromatography to identify unknown substances in mixtures. • Identifying variables for fair testing 	<ul style="list-style-type: none"> • Cells are the basic unit of life; their structure, function & how cells can be specialised • similarities & differences between plant & animal cells • role of diffusion in the movement of materials in & between cells • observe cells using a microscope • Process of reproduction in mammals & plants; inc. parts of reproductive system, changes at adolescence, menstrual cycle & stages of pregnancy 	<ul style="list-style-type: none"> • FORCES Predict the effect of forces on objects including floating, gravity, friction etc. • FORCES use force arrows in diagrams for balanced and unbalanced forces • FORCES Describe the positions of objects in space in relation to one another to explain seasons, moon phases, eclipses • SKILLS Speed & the quantitative relationship between ave. speed, distance and time • SKILLS Draw and interpret a distance-time graph 	<ul style="list-style-type: none"> • analyse food webs and food chains • Understand the interdependence of ecosystems • How adaptations help some species to be better suited to a particular environment • Types of variation that exist between members of the same and different species – be able to illustrate using graphs 	<ul style="list-style-type: none"> • classify reactions as either chemical or physical reactions • Investigate combustion and incomplete combustion • defining acids and alkalis in terms of neutralisation reactions • describe the pH scale and indicators • reactions of acids with metals to produce a salt plus hydrogen • reactions of acids with alkalis to produce a salt plus water 	<ul style="list-style-type: none"> • ENERGY energy as a quantity that can be quantified and calculated; the total energy has the same value before and after a change • ENERGY heating & thermal equilibrium: temp. difference between two objects leading to energy transfer through conduction or radiation • ENERGY Evaluate the use of Fossil fuels v renewable energy resources • SKILLS Calculation of fuel uses and costs in the domestic context
	KS2 Continuity					

YEAR 8 7 (on rotation)	Organisms & Body Systems	Periodic Table	Sound and Light Waves	Inheritance & Selection	Geochemistry	Magnetism and Electricity
	<ul style="list-style-type: none"> • structure & functions of the human skeleton, digestive system & respiratory system • content of a healthy human diet • how the digestive system digests food • how the respiratory system is adapted for efficient gas exchange • describe respiration (& anaerobic respiration) as chemical reactions that take place in all cells 	<ul style="list-style-type: none"> • differences between atoms, elements & compounds • Using chemical symbols & formulae for elements & compounds • principles underpinning the Periodic Table & how patterns in reactions can be predicted with reference to the Periodic Table • the properties of metals & non-metals 	<ul style="list-style-type: none"> • WAVES use of ray model to explain imaging in mirrors, pinhole camera, refraction and action of convex lens (link to the human eye) • WAVES describe colours & the different frequencies of light, white light and prisms • WAVES investigate that sound is produced by vibrations of objects (in loud speakers, detected by their effects on microphone diaphragm and ear drum) • SKILLS 	<ul style="list-style-type: none"> • heredity as the process by which genetic information is transmitted from one generation to the next • a simple model of chromosomes, genes & DNA in heredity, inc. the part played by Watson & Crick in the discovery of the DNA model • variation between species & between individuals of the same species means some organisms compete more successfully; which drives natural selection 	<ul style="list-style-type: none"> • the composition & structure of the Earth • the rock cycle and the formation of igneous, sedimentary & metamorphic rocks • the carbon cycle; including the production of carbon dioxide by human activity and the impact on climate. 	<p>FIELDS Describe magnetism and its uses</p> <ul style="list-style-type: none"> • ELECTRICITY Relate static electricity to charged particles • ELECTRICITY Magnetism and static electricity as non-contact forces • ELECTRICITY Create & compare electrical circuits in series and parallel • ELECTRICITY Measure and describe effects of resistance, voltage and current • ELECTRICITY Electrical safety • SKILLS
YEAR 9 7 (on rotation)	Microbiology Chemical & Energy Changes	Forces in Action	Cells	Atmosphere	Energy	How Science Works (all classes)
	<p><u>Microbiology:</u></p> <ul style="list-style-type: none"> • Structure and function of bacterial cells • Role of microorganisms in causing disease and how the body fights infections • How vaccination works and evaluating its safety • Role of microorganisms in food production 	<ul style="list-style-type: none"> • FORCES predict movement related to contact and non-contact forces • PARTICLES investigate changes in pressure (in gases and liquids) related to particle model • SKILLS Calculate and draw graphs to show speed & acceleration • SKILLS Calculations to explain situations involving moments. • SKILLS Calculate and compare work done by a variety of machines 	<ul style="list-style-type: none"> • Structure and function of cells (inc. ribosome, mitochondria) • Microscopes & calculating magnification • Cell specialisation • Cell division; Mitosis • Transport in and out of cells; Diffusion, osmosis & active transport <p>AQA Required practicals 1 and 3.</p>	<ul style="list-style-type: none"> • How the Earth's atmosphere has changed over time • Relationship between the greenhouse effect and climate change • Chemical properties and structure of hydrocarbons (inc. use as plastics) • Understand sources of air pollution related to human activities 	<ul style="list-style-type: none"> • ENERGY Energy changes in a system, and the ways energy is stored before and after such changes • ENERGY Conservation and dissipation of energy • ENERGY National and global energy resources • SKILLS Manipulate formulae including power, efficiency and cost of electricity 	<ul style="list-style-type: none"> • Use scientific theories and explanations to develop hypotheses • Explain the need to manipulate and control variables. • Suggest methods of reducing the risk of harm in practical contexts • Assess whether sufficient, precise measurements have been taken in an experiment.

<u>Chemical and energy changes:</u> <ul style="list-style-type: none"> • Investigate the reactivity series • use reactivity series to predict displacement reactions & metal extraction methods • write balanced chemical equations for reactions that make salts • differences between endothermic and exothermic reactions 				<ul style="list-style-type: none"> • Translate data between graphical and numeric form. • evaluating data in terms of accuracy, precision, repeatability and reproducibility and identifying potential sources of error.
Options Round 2				

St Bede's Curriculum Design Principles

Within subjects: depth, relevance, sequencing, spacing (**PHYSICS KEY IDEAS** FORCES:WAVES:PARTICLES:ENERGY:FIELDS)

Between subjects: breadth, cultural capital, coherence, progression, interlinking

All topics are rotated:

Year 7:	All class study 'Safety in the Science Lab & Particles' in Term 1 *Cells and Reproduction & Forces and the Universe – a class will study one topic in Term 2 and the other in Term 3 **Eco Systems, Chemical Reactions, Heating and Energy – a class will study one per term in Terms 4, 5 & 6
Year 8:	Organisms & Body Systems, Periodic Table & Sound and Light Waves - a class will study one per term in Terms 1, 2 & 3 Inheritance & Selection, Geochemistry & Magnetism and Electricity - a class will study one per term in Terms 4, 5 & 6
Year 9:	Microbiology, Chemical & Energy Changes & Forces in Action – a class will study these three topic during terms 1 & 2 Cells, Atmosphere & Energy - a class will study one per term in Terms 3, 4 & 5 All class will study 'How science works' in Term 6