

Autumn Term

	Chemistry	Elements and compounds	<p>Threshold concept: Atoms, Elements, Compounds, Mixtures: To include the difference between these and common examples.</p> <p>General Equations: To include the law of conservation of mass and why this means we need to balance equations, also includes how to balance equations.</p> <p>Key knowledge</p> <ul style="list-style-type: none"> • Define atom • Elements and properties • Physical and chemical properties • Hazard symbols • Molecules and compounds • How to form compounds • Naming compounds 	<p>Key Vocabulary</p> <p>Element Compound Hazard Molecule Property</p>
			<p>Watch the following videos to recap knowledge: What Is An Element, Mixture And Compound? Properties of Matter Chemistry FuseSchool Elements, compounds and mixtures - BBC Bitesize Atoms and molecules - BBC Bitesize What are elements in science? KS3 guide for chemistry students - BBC Bitesize</p>	
	Physics	Heating and Cooling	<p>Threshold concept: Particle model: To describe the structure of Solids, liquids and gases and the changes in state.</p>	<p>Key Vocabulary</p> <p>Conductor Insulator Volume Cooling rate</p>



		<p>Electricity: Current as the (rate of) flow of charge. Components with resistance reduce the current. In series circuits the current is the same everywhere in the circuit. In parallel circuits the current divides Electricity is generated using renewable and non-renewable resources</p> <p>Key knowledge</p> <ul style="list-style-type: none"> • Measuring temperature and units • The difference between chemical and physical change • Particle model - the differences in arrangements, in motion and in closeness of particles explaining • changes of state, shape and density, the anomaly of ice-water transition • Energy in matter - changes with temperature in motion and spacing of particles • Internal energy stored in materials • Conductors and insulators 	Expand Contract
	<p>Watch the following videos to recap knowledge: Changes of state - Solids, liquids and gases - KS3 Physics - BBC Bitesize Solids, liquids and gases - Solids, liquids and gases - KS3 Physics - BBC Bitesize Heating Energy Physics FuseSchool Heat Flow - Conduction, Convection and Radiation</p>		
Biology	Health, diet and disease	<p>Threshold concept: Disease and immunity To include communicable and non-communicable diseases and the immune response.</p> <p>Key knowledge</p> <ul style="list-style-type: none"> • Defining health • Nutrients and balanced diets • Food as an energy store 	Key Vocabulary disease deficiency Body Mass Index (BMI) obesity respiration heart rate



		<ul style="list-style-type: none"> Calculating energy gained from food using data from a practical investigation Starvation and deficiency diseases Obesity, cardiovascular disease and BMI calculations Effects of exercise on heart and breathing rate 	
		<p>Watch the following videos to recap knowledge:</p> <p>Healthy diet - Nutrition, digestion and excretion - KS3 Biology - BBC Bitesize</p> <p>Obesity - Nutrition, digestion and excretion - KS3 Biology - BBC Bitesize</p> <p>Malnutrition - Nutrition, digestion and excretion - KS3 Biology - BBC Bitesize</p> <p>Balanced diet Health Biology FuseSchool</p>	

Spring Term			
	Chemistry	Understanding chemical reactions	<p>Threshold concept: Atoms, Elements, Compounds, Mixtures: To include the difference between these and common examples.</p> <p>General Equations: To include the law of conservation of mass and why this means we need to balance equations, also includes how to balance equations.</p> <p>Key knowledge</p> <ol style="list-style-type: none"> Know the difference between a physical and chemical reaction. Physical - reversible and no new products. Chemical irreversible and new products. Write word equations from different scenario texts. Understand terms reactants and products. Write chemical formula correctly. Know key chemical formula like water and carbon dioxide. Understand the conservation of mass. Balance simple equations. Balance simple equations.



		<p>6. Understand when an acid reacts with a metal it always forms a salt and hydrogen. 7. Name salts formed when metal + acid 8. Know oxidation means the addition of oxygen to form a metal oxide 9. Know precipitation is a reaction when 2 liquid react to form an insoluble solid. To know substances can be broken down using heat.</p>	
		<p>Watch the following videos to recap knowledge: What is a chemical reaction? - BBC Bitesize Writing word equations - BBC Bitesize Writing symbol equations - BBC Bitesize What is a neutralisation reaction? - BBC Bitesize Chemical Equations Environmental Chemistry Chemistry FuseSchool How To Balance Equations - Part 1 Chemical Calculations Chemistry FuseSchool</p>	
Physics	Images and how we see	<p>Threshold concept: Light: Visible light as a spectrum of colours of different wavelengths and frequencies Light travels in straight lines called rays, which can change direction at a boundary between different media</p> <p>Key knowledge</p> <ol style="list-style-type: none"> 1. Know that law of reflection. 2. Know how a dense object slows down the wavefronts of light, refraction. 3. Know that a spectrum is made from white light, colours are difference wavelengths of light, how colour effects in absorption and diffuse reflection. 4. Know how colour filters absorb or transmit different wavelengths of light. 5. Know the parts of the eye and photosensitive material in the retina. 6. Know the different type of lenses and how to use them in cameras. 	<p>Key Vocabulary Medium ray incident reflected refracted absorb transmit specular diffuse</p>
		<p>Watch the following videos to recap knowledge:</p> <ul style="list-style-type: none"> - Ray diagrams Waves Physics FuseSchool - Wave Behaviour Waves Physics FuseSchool - Ray diagrams and transmission of light guide for KS3 physics students - BBC Bitesize - Reflection guide for KS3 physics students - BBC Bitesize - Refraction and lenses guide for KS3 physics students - BBC Bitesize 	



Biology	Reproduction in humans and plants	Threshold concept: Cells and the cell cycle To include the differences between animal, plant and bacterial cells, cell division, and organisation of cells, tissues and organs. The genome To include the structure of DNA, heredity, protein synthesis and the importance of genetic mutation in variation. Key knowledge <ul style="list-style-type: none">• Lifecycles and reproduction• Puberty and sexual maturation in humans• Gametes and fertilisation• Human reproductive organs• The human menstrual cycle• Gestation, birth and healthy pregnancy• Flower structure• Pollination and fertilisation• Insects as pollinators and food security• Fruits and seeds• Seed dispersal	Key Vocabulary sexual reproduction zygote gamete fertilisation menstrual cycle foetus embryo
		Watch the following videos to recap knowledge: Human reproduction - Reproduction - KS3 Biology - BBC Bitesize Fertilisation - Reproduction- KS3 Biology - BBC Bitesize Puberty and The Hormones Involved Physiology Biology FuseSchool Changes that occur during the menstrual cycle - Reproduction - KS3 Biology - BBC Bitesize What is pollination? Reproduction - KS3 Biology - BBC Bitesize Fruit and seeds - Reproduction - KS3 Biology - BBC Bitesize What Is The Menstrual Cycle? Physiology Biology FuseSchool	



Summer Term

	Chemistry	Fuels and energetics	<p>Threshold concept: Energy in chemical: reactions: To include the concepts of exo/endermotic reactions in terms of bond breaking and making and the concepts of activation energy.</p> <p>Key knowledge</p> <ul style="list-style-type: none"> • Energy changes in a reaction • What exothermic and endothermic means • Energy needed for a reaction to start • How catalysts change the energy in a reaction 	<p>Key Vocabulary</p> <p>Exothermic Endothermic Activation energy Catalyst</p>
			<p>Watch the following videos to recap knowledge:</p> <ul style="list-style-type: none"> - What are exothermic and endothermic reactions? - BBC Bitesize - Catalysts guide for KS3 chemistry students - BBC Bitesize - What Are Endothermic & Exothermic Reactions Chemistry FuseSchool - What Are Catalysts? Reactions Chemistry FuseSchool 	
	Chemistry	Earth's resources	<p>Threshold concept: Atoms, Elements, Compounds, Mixtures: To include the difference between these and common examples.</p> <p>Key knowledge</p> <ul style="list-style-type: none"> • Structure of the Earth • Types of rock • The Rock cycle • Igneous rock • Metamorphic rock 	<p>Key Vocabulary</p> <p>Igneous Metamorphic Sedimentary Crust Core</p>
			<p>Watch the following videos to recap knowledge:</p> <ul style="list-style-type: none"> - Structure Of The Earth & Its Different Layers Environmental Chemistry Chemistry FuseSchool - What Is The Rock Cycle? Environmental Chemistry Chemistry FuseSchool - The rock cycle - The Earth and atmosphere - KS3 Chemistry - BBC Bitesize - Rock types - The Earth and atmosphere - KS3 Chemistry - BBC Bitesize 	



	<p>Biology</p> <p>Interdependence and organisms in the environment</p>	<p>Threshold concept: Ecology To include interactions and interdependence between organisms.</p> <p>Key knowledge</p> <ul style="list-style-type: none"> • Food chains • Food webs • Ecosystems and habitats • Chemicals in farming and bioaccumulation • Interdependence within ecosystems • Pyramids of number • Pyramids of biomass • Estimating populations of organisms using sampling techniques • Sampling using quadrats and belt transects 	<p>Key Vocabulary</p> <p>habitat population ecosystem interdependence trophic level pyramid of biomass sampling</p>
		<p>Watch the following videos to recap knowledge: Food Chains & Food Webs Ecology & Environment Biology FuseSchool What Is An Ecosystem? Ecology & Environment Biology FuseSchool Bioaccumulation - KS3 Biology - BBC Bitesize Ecological Pyramids Ecology & Environment Biology FuseSchool What Is Environmental Sampling? Ecology & Environment Biology FuseSchool</p>	
	<p>Physics</p> <p>Motion and forces</p>	<p>Threshold concept: Motion: Speed is the rate of change of distance, and acceleration is the rate of change of speed/velocity</p> <p>Forces: Forces, both contact and non-contact, can be represented with arrows and the motion of an object depends on the resultant force acting on the object</p> <p>Key knowledge Describing motion</p> <ul style="list-style-type: none"> • speed and the quantitative relationship between average speed, distance and time (speed = distance ÷ time) • the representation of a journey on a distance-time graph 	<p>Key Vocabulary</p> <p>Speed Acceleration Friction Air resistance Thrust Relative Newton Moment</p>



		<ul style="list-style-type: none">• Relative motion: trains and cars passing one another. <p>Forces</p> <ul style="list-style-type: none">• forces as pushes or pulls, arising from the interaction between two objects• using force arrows in diagrams, adding forces in one dimension, balanced and unbalanced forces• moment as the turning effect of a force• forces: associated with deforming objects; stretching and squashing – springs; with rubbing and friction between surfaces, with pushing things out of the way; resistance to motion of air and water• forces measured in newtons, measurements of stretch or compression as force is changed• force-extension linear relation; Hooke’s Law as a special case• work done and energy changes on deformation	
		<p>Watch the following videos to recap knowledge:</p> <ul style="list-style-type: none">- Introduction to forces - Forces and movement - KS3 Physics - BBC Bitesize- Force diagrams and resultant forces - Forces and movement - KS3 Physics - BBC Bitesize- Motion and speed - Forces and movement - KS3 Physics - BBC Bitesize- Moments - Forces and movement - KS3 Physics - BBC Bitesize- Forces That Cause Change Forces & Motion Physics FuseSchool- Calculating Speed Forces & Motion Physics FuseSchool- Moments Forces & Motion Physics FuseSchool	



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