

Curriculum Long Term Planning Overview	Key Stage 3	Subject Area: Science
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Year	Study Modules	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1	Summer Term 2
Year 7	Study Modules	7E Mixtures & Separation <ul style="list-style-type: none"> Identify mixtures and how they can be separated using simple techniques; sieving, filtering, decanting, magnetism, evaporation Describe dissolving of substances using key terminology; solvent, solute, soluble, solution Explain how distillation can be used to separate mixtures 	7B Reproduction <ul style="list-style-type: none"> Gametes in fertilisation (internal and external) Reproductive organs (label and functions) Becoming pregnant Gestation, nutrient exchange and pregnancy Giving birth Puberty and menstruation Contraception Use of reproduction in zoos 	7F Acids & Alkalis <ul style="list-style-type: none"> Hazard symbols Properties of acids and alkalis Indicators pH scale Neutralisation Word equations Preparing a soluble salt Neutralisation in daily life 	7I Energy <ul style="list-style-type: none"> Humans receive their energy from food Compare the energy released per gram of food To know that different food contain different amounts of energy per gram Different people require different amounts of energy from food Law of Conservation of Energy Energy transfers and stores Fuels, including formation of fossil fuels and their classification as non-renewable and renewable. 	7D Ecosystems <ul style="list-style-type: none"> the concept of a habitat Variation between organisms and within populations continuous and discontinuous variation. adaptations of organisms to their environments. how changes in the environment affect the organisms living in a habitat the resources needed by organisms from their habitats and how organisms affect their habitats the flow of energy through food chains, food webs 	7C Muscles & Bones <ul style="list-style-type: none"> Antagonistic Pairs of Muscles Ligaments/Tendons/Muscles Function of Bones Support/Movement/ Manufacture of RBCs Describe different Joints (x3) Name and describe blood vessels Name and describe constituents of Blood Effect of drugs (stimulant Vs Depressant)

					<ul style="list-style-type: none"> • How to compare amounts of energy released by different fuels. • What renewable energy resources are and that the energy obtained from most originates in the Sun. • Advantages and disadvantages of different energy resources. • Explain energy efficiency and calculate the efficiency of devices • That climate change is being caused by adding carbon dioxide to the atmosphere and ways we could reduce our use of fossil fuels. 	<ul style="list-style-type: none"> • and pyramids of numbers. • how some persistent pesticides accumulate in food chains. 	
	<p>7A Cells, Tissues & Organ Systems</p> <ul style="list-style-type: none"> • MRSGREN • Names and function of the main human organs 	<p>7G The Particle Model</p> <ul style="list-style-type: none"> • Identify and describe the behaviour of solids, liquids and gases • Use the particle model to explain 	<p>7K Forces</p> <ul style="list-style-type: none"> • Define contact and non-contact forces • Define weight and mass with calculations and units 	<p>7H Atoms, Elements & Molecules</p> <ul style="list-style-type: none"> • Matter is made of different types of particles made of atoms • How our understanding of 	<p>8A Food & Digestion</p> <ul style="list-style-type: none"> • contents of a healthy human diet: carbohydrates, lipids, proteins, vitamins, 	<p>7L Sound</p> <ul style="list-style-type: none"> • State how sound is produced • Define what a wave is • State that sound is a longitudinal wave and can be 	

<ul style="list-style-type: none"> Names and functions of plant organs Photosynthesis word equation Define tissue with examples (animal and plant) Describe the function of tissues and why they are important Animal vs plant organelles Specialised cells The circulatory system in detail Transport systems in plants Know the main organs that can be transplanted in humans 	<p>they physical behaviours of solids liquids and gases</p> <ul style="list-style-type: none"> Brownian motion is random and unpredictable Describe net movement of particles using diffusion Describe the impact of pressure on particle arrangement 	<ul style="list-style-type: none"> Spring characteristics and measuring extension Hooke's Law(experiment + elastic limit) Friction and how to reduce it Pressure definition and use of equation + unit Balanced and unbalanced forces, diagrams, calculations and effects (Free body diagrams and Force diagrams) Balanced forces and Force meters (Newton meters) 	<p>elements has changed over time</p> <ul style="list-style-type: none"> How metals and non-metals differ in their properties Elements forming compounds with specific names Word equations (reactants, products, symbols) 	<p>minerals, fibre and water, and why each is needed</p> <ul style="list-style-type: none"> calculations of energy requirements in a healthy daily diet the tissues and organs of the human digestive system, including adaptations to function enzymes as biological catalysts and their action the role of diffusion in the movement of materials in and between cells 	<p>reflected or absorbed</p> <ul style="list-style-type: none"> Link pitch to frequency of a sound wave Link volume to amplitude of a sound wave Compare speed of sound in different materials Describe how sound travels through the human ear State human range of hearing (Hz) Define infrasound and ultrasound and state uses of ultrasound Describe constructive and destructive interference
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	<p>7E Mixtures & Separation Design a water filter that can purify dirty water, and create a poster explaining its function and justifying your choice of materials.</p> <p>Also assessed in Autumn term assessment papers.</p>	<p>7B Reproduction Assessed as part of Autumn term assessment papers.</p>	<p>7F Acids & Alkalis Badger assessment task: How do antacid tablets work?</p> <p>Also assessed in Summer term assessment papers.</p>	<p>7I Energy Practical skills assessment – Planning an investigation to measure the efficiency of burning food to find its energy content. Also assessed in Summer term assessment papers.</p>	<p>7D Ecosystems Practical skills assessment: Collecting and presenting transect and quadrat data while investigating species populations.</p> <p>Also assessed in Summer term assessment papers.</p>	<p>7C Muscles & Bones Assessed as part of End of Year 7 assessment papers.</p>
Assessment	<p>7A Cells, Tissues & Organ Systems Scale drawing & Microscope skills assessment: Estimate FOV of microscope, sketch a scale labelled diagram of a cell and calculate the actual size. Also assessed in Autumn term assessment papers.</p>	<p>7G The Particle Model Assessed as part of Autumn term assessment papers.</p>	<p>7K Forces Graph skills assessment: Investigate the relationship between force and extension on a spring and plot this relationship on a suitable graph. Also assessed in Summer term assessment papers.</p>	<p>7H Atoms, Elements & Molecules Mini assessment on definitions, naming conventions, word equations and chemical equations. Also assessed in Summer term assessment papers.</p>	<p>8A Food & Digestion Badger assessment task: The journey of a cheese sandwich. Also assessed in Summer term assessment papers.</p>	<p>7L Sound Assessed as part of End of Year 7 assessment papers.</p>
Builds Upon	<p>7E Mixtures & Separation KS2:</p> <ul style="list-style-type: none"> state changes Measuring temperature in °C 	<p>7B Reproduction KS2:</p> <ul style="list-style-type: none"> describe the life process of reproduction in 	<p>7F Acids & Alkalis KS2:</p> <ul style="list-style-type: none"> Describe the properties of 	<p>7I Energy KS2:</p> <ul style="list-style-type: none"> recall that temperature is a measure of how 	<p>7D Ecosystems KS2:</p> <ul style="list-style-type: none"> describe how different habitats provide for the basic needs of 	<p>7C Muscles & Bones KS2:</p> <ul style="list-style-type: none"> identify that humans and some other animals

	<ul style="list-style-type: none"> the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature understand how some materials dissolve in liquid to form a solution describe how to recover a substance from a solution Separation of mixtures through filtering, sieving and evaporating demonstrate that dissolving, mixing and changes of state are reversible changes <p>No prerequisites from KS3 topics.</p>	<p>some plants and animals</p> <ul style="list-style-type: none"> describe the changes as humans develop to old age <p>KS3: 7A Cells, Tissues & Organ Systems</p>	<p>different materials</p> <p>No prerequisites from KS3 topics.</p>	<p>hot or cold something is and be able to use thermometers</p> <ul style="list-style-type: none"> describe some materials as thermal conductors and some as thermal insulators understand that burning is an irreversible change recall that plants need sunlight to grow and that animals, including humans, need food. <p>No prerequisites from KS3 topics.</p>	<p>animals and plants, and how they depend on each other</p> <ul style="list-style-type: none"> construct Food chains, identifying producers, predators and prey describe how living things are classified into broad groups according to characteristics <p>No prerequisites from KS3 topics.</p>	<p>have skeletons and muscles for support, protection and movement.</p> <p>No prerequisites from KS3 topics.</p>
	<p>7A Cells, Tissues & Organ Systems KS2:</p> <ul style="list-style-type: none"> Function of parts of flowering plants requirements of plants for life and growth Water transport in plants 	<p>7G The Particle Model KS2:</p> <ul style="list-style-type: none"> compare and group materials together as solids, liquids or gases understand that some materials will dissolve in 	<p>7K Forces KS2:</p> <ul style="list-style-type: none"> describe different kinds of forces, including magnetism, gravity, upthrust and friction, and 	<p>7H Atoms, Elements & Molecules KS2:</p> <ul style="list-style-type: none"> compare and group materials together as solids, liquids or gases observe that materials change 	<p>8A Food & Digestion KS2:</p> <ul style="list-style-type: none"> recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function 	<p>7L Sound KS2:</p> <ul style="list-style-type: none"> State that sounds are made by vibrations State that pitch is how high or low a sound is, and that

<ul style="list-style-type: none"> • pollination, seed formation and seed dispersal • basic parts of the digestive system in humans • main parts of the human circulatory system <p>No prerequisites from KS3 topics.</p>	<p>liquid to form a solution, and describe how to recover a substance from a solution</p> <ul style="list-style-type: none"> • decide how mixtures might be separated, including through filtering, sieving and evaporating <p>No prerequisites from KS3 topics.</p>	<p>be able to classify these as contact or non-contact forces</p> <ul style="list-style-type: none"> • identify the effect of drag forces that act between moving surfaces • describe why moving objects that are not driven tend to slow down. <p>No prerequisites from KS3 topics.</p>	<p>state when heated or cooled, and measure the temperature at which this happens in °C</p> <ul style="list-style-type: none"> • demonstrate that dissolving, mixing and changes of state are reversible changes • compare and group substances by their properties. • explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible. <p>KS3:</p> <ul style="list-style-type: none"> • 7E Mixtures & Separation topics • 7F Acids & Alkalis • 7G The Particle Model 	<p>KS3:</p> <ul style="list-style-type: none"> • 7A Cells, Tissues & Organ Systems • 7C Muscles & Bones • 7D Ecosystems • 7G The Particle Model • 7I Energy 	<p>volume is how loud or quiet a sound is</p>
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Year	Study Modules	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1	Summer Term 2
Year 8	Study Modules	8I Fluids <ul style="list-style-type: none"> Using the particle model of matter, describe how the volumes and densities of substances change at different temperatures. Compare chemical and physical changes with examples. Describe the effect of physical weathering. Explain what happens to particles and temperature during changes of state, in terms of energy and forces. Compare densities of materials and link them to the mass of the particles and how closely they pack together. 	8D Unicellular Organisms <ul style="list-style-type: none"> How to observe cells using a light microscope Understand that the cell is the fundamental unit of all living things Explain the difference between plant, animal, and bacterial cells Understand that nearly all life on Earth depends on the ability of photosynthetic organisms to build organic molecules Understand the role of diffusion in the movement of materials The difference between aerobic and anaerobic respiration, including word equations of each How energy is transferred through 	8E Combustion <ul style="list-style-type: none"> Structure of word equations Define combustion and incomplete combustion with a word equation Describe the health implications of incomplete combustion Describe combustion as an exothermic reaction Define oxidation with word equations Development of the Law of conservation of mass (phlogiston) Law of conservation of mass Fire safety Environmental consequences of combustion Catalytic converters 	8L Earth & Space <ul style="list-style-type: none"> non-contact forces: gravity forces acting at a distance on Earth and in space, forces between magnets magnetic poles, attraction and repulsion magnetic fields by plotting with compass, representation by field lines Earth's magnetism, compass and navigation gravity force, weight = mass \times gravitational field strength (g), on Earth $g = 10 \text{ N/kg}$, different on other planets and stars; gravity forces between Earth and Moon, and between Earth and Sun (qualitative only) 	8J Light <ul style="list-style-type: none"> State that light is a transfer wave Compare the speeds of light and sound State the speed of light in a vacuum Describe what can happen to light at a boundary (absorption, transmission, reflection, refraction) Draw ray diagrams/use ray models Describe uses of lenses in cameras Describe how light travels through the human eye State that white light is made up of many colours Explain why we see different objects as different colours 	8H Rocks <ul style="list-style-type: none"> Identify the uses of different rocks based on grain size Describe how rocks are formed (igneous, metamorphic and sedimentary) Explain weathering and erosion and the impacts of this Identify that rocks are a source of metals and minerals

<ul style="list-style-type: none"> • Explain why ice is less dense than water. • Use the idea of latent heats when discussing changes of state. • Use the particle model of matter to explain why gas pressure changes with temperature, number of particles and volume. • Use the equation relating pressure to the depth and density of a liquid. • Explain that the upthrust depends on the weight of fluid displaced. • Use ideas about displacement to explain phenomena connected with floating and sinking. • Describe the causes of air and water resistance. • Describe the ways in which the 	<p>ecosystems using food chains and pyramids of numbers</p> <ul style="list-style-type: none"> • Explain how carbon is cycled through an ecosystem 	<ul style="list-style-type: none"> • Global Warming (graphical evidence over time) 	<ul style="list-style-type: none"> • our Sun as a star, other stars in our galaxy, other galaxies • the seasons and the Earth's tilt, day length at different times of year, in different hemispheres • the light year as a unit of astronomical distance. • apply mathematical concepts and calculate results 		
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	<p>size of drag forces can be changed.</p> <ul style="list-style-type: none"> Explain why a vehicle needs a force from the engine to keep moving at a constant speed. 					
	<p>8C Breathing & Respiration</p> <ul style="list-style-type: none"> Define diffusion and explain how O₂ and CO₂ diffuse between the alveoli and capillaries. Label and state the function of the structures in the respiratory system. Understand the function of mucus and cilia. Understand that alveoli increase the surface area for gas exchange. Write the word equations for aerobic and anaerobic respiration. Use a model to explain how changes in 	<p>8K Energy Transfers</p> <ul style="list-style-type: none"> Define internal(thermal) energy and temperature. Describe the factors that affect the amount of energy stored in a heated substance Explain the process of evaporative cooling. Describe the processes of conduction and convection using the particle model Explain radiative heating/cooling as an energy transfer Evaluate ways of increasing or decreasing energy transfer by 	<p>8F The Periodic Table</p> <ul style="list-style-type: none"> Development of the atomic model Atoms are the smallest chemical unit Representing elements as symbols Development of the periodic table Reading the periodic table (groups, periods and symbols) Particles are made of subatomic particles with a specific arrangement Physical and chemical properties of matter Particles have different physical 	<p>8B Plants & their Reproduction</p> <ul style="list-style-type: none"> Describe the characteristics of organisms in the five kingdoms. Identify the genus and species names from a scientific name. Explain why biodiversity is important. State the difference between asexual and sexual reproduction. Recall ways in which plants reproduce asexually. Describe what happens during fertilisation. 	<p>8G Metals & their Uses</p> <ul style="list-style-type: none"> Properties of metals Uses of metals Metals as catalysts Differences between corrosion and rusting Chemical reactions; symbol and word equations Reactions of metals with water Reactions of metals with acids Pure metals and alloys Uses and properties of alloys Melting and boiling points of substances 	<p>7J Electrical Circuits</p> <ul style="list-style-type: none"> Definitions of the key variables Current, Potential difference/Voltage, Resistance. Definitions and properties of series and parallel circuits. Describe what happens when the number of bulbs in a series circuit changes. Describe what current is and how it is measured. Use models to understand the flow of electricity in circuits, and discuss the strengths and weaknesses of individual models.

<p>pressure cause air to move in and out of the lungs.</p> <ul style="list-style-type: none"> • The impact of exercise, asthma, and smoking on gas exchange • The components of blood and the different types of blood vessels. • The use of limewater and hydrogen carbonate indicator as tests for carbon dioxide. • The function of gills and stomata in gas exchange. • The difference between aerobic and anaerobic respiration, including the reactants, products, and why your body needs to use both types. • Explain why EPOC (excess post-exercise oxygen consumption) is necessary after anaerobic respiration. 	<p>conduction, convection, radiation and evaporation.</p> <ul style="list-style-type: none"> • Explain the concept of thermal mass in homes. • Describe what power and efficiency mean • Calculate power and efficiency • Interpret Sankey diagrams • Explain how the kWh is a unit of energy and use it to determine the cost of electricity. <p>Explain what payback time is and calculate it.</p>	<p>and chemical properties</p> <ul style="list-style-type: none"> • Reactions of elements • Conservation of mass • Equations are balanced • Writing chemical formulae • Trends on the periodic table (physical and chemical) 	<ul style="list-style-type: none"> • Identify and give examples of inherited variation. • Identify the main parts of a flower and describe their functions. • Identify how a flower is pollinated based on its shape/pollen type. • Describe how the parts of a flower are adapted to their functions. • Explain how and why plants avoid self-pollination. • Identify different kinds of fruits and describe how they disperse seeds. • Explain the importance of seed dispersal. • Recall the resources needed for germination and how this occurs. • Describe what happens in photosynthesis and respiration. • Describe examples of interdependence 		<ul style="list-style-type: none"> • Explain how switches and location control different kinds of circuits. • Describe how changing the number or type of components in a circuit affects the current. • Describe the differences in how current behaves in series and parallel • Describe how voltage is measured, and how a voltmeter is used. • Explain why the current increases when the voltage increases • Describe the relationship between resistance and current. • Explain the safety precautions that should be followed when using electricity. • Explain how fuses and circuit
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				and how changes in a population or community affect other populations.		breakers protect the user. <ul style="list-style-type: none"> Recall how plugs are wired.
Assessment	<p>8I Fluids</p> <p>Practical skills assessment (Technique and data manipulation): Find the density of objects and determine whether they will float in a strange fluid.</p> <p>Also assessed in Autumn term assessment papers.</p>	<p>8D Unicellular Organisms</p> <p>Assessed as part of Autumn term assessment papers.</p>	<p>8E Combustion</p> <p>Practical skills assessment (Planning): Investigating the effect of candle height on burn time for a candle in a jar.</p> <p>Also assessed in Summer term assessment papers.</p>	<p>8L Earth & Space</p> <p>Maths skills assessment: Calculations involving Weight and mass on different planets and moons.</p> <p>Also assessed in Summer term assessment papers.</p>	<p>8J Light</p> <p>Practical skills assessment (Measurement techniques): Investigate how the angle of incidence of a ray on a Perspex block affects the angle of refraction.</p> <p>Also assessed in Summer term assessment papers.</p>	<p>8H Rocks</p> <p>Assessed as part of End of Year 8 assessment papers.</p>
	<p>8C Breathing & Respiration</p> <p>Practical skills assessment (Graph skills): Investigating the effects of exercise on the time needed for pulse rate and breathing rate to recover.</p> <p>Also assessed in Autumn term assessment papers.</p>	<p>8K Energy Transfers</p> <p>Assessed as part of Autumn term assessment papers.</p>	<p>8F Periodic Table</p> <p>Students research and create poster on an element of their choice describing properties, abundance, discovery, and some examples of compounds containing it.</p> <p>Also assessed in Summer term assessment papers.</p>	<p>8B Plants & their Reproduction</p> <p>Practical skills assessment (Scientific drawing): Dissection of flower.</p> <p>Also assessed in Summer term assessment papers.</p>	<p>8G Metals & their Uses</p> <p>Practical Skills assessment, recording and analysing results: Investigating the reactivity of metals with Acids.</p> <p>Also assessed in Summer term assessment papers.</p>	<p>7J Electrical Circuits</p> <p>Assessed as part of End of Year 8 assessment papers.</p>

Builds Upon	<p>8I Fluids</p> <p>KS2:</p> <ul style="list-style-type: none"> • classify substances as solids, liquids or gases • observe and name changes of state • identify the effects of air resistance and water resistance. <p>KS3:</p> <ul style="list-style-type: none"> • 7G The Particle Model • 7H Atoms, Elements & Compounds • 7K Forces 	<p>8D Unicellular Organisms</p> <p>KS2:</p> <ul style="list-style-type: none"> • Define a microorganism • Recall the seven life processes • Explain that different cells are specialised for different functions • Describe how organisms are interdependent in an ecosystem <p>KS3:</p> <ul style="list-style-type: none"> • 7A Cells, Tissues, Organs & Systems • 7D Ecosystems • 8B Plants & Reproduction • 8C Breathing and Respiration 	<p>8E Combustion</p> <p>KS3:</p> <ul style="list-style-type: none"> • 7F Acids & Alkalis • 7G The Particle Model • 7H Atoms, Elements & Compounds • 7I Energy 	<p>8L Earth & Space</p> <p>KS2:</p> <ul style="list-style-type: none"> • describe the movement of the Earth and other planets relative to the Sun • describe the movement of the Moon relative to the Earth • describe the Sun, Earth and Moon as approximately spherical bodies • use the idea of the Earth's rotation to explain day and night <p>KS3: 7K Forces</p>	<p>8J Light</p> <p>KS2:</p> <ul style="list-style-type: none"> • State that light travels in straight lines • Describe how we can see objects <p>KS3: 7L Sound</p>	<p>8H Rocks</p> <p>KS2:</p> <ul style="list-style-type: none"> • compare and group together different kinds of rocks on the basis of their appearance and simple physical properties • describe in simple terms how fossils are formed when things that have lived are trapped within rock. <p>KS3: 7H Atoms, Elements & Compounds</p>
	<p>8C Breathing & Respiration</p> <p>KS2:</p> <ul style="list-style-type: none"> • Understand that we have many different types of cell that have different functions. • State the names and functions of the main organs in the respiratory system. 	<p>8K Energy Transfers</p> <p>KS3:</p> <ul style="list-style-type: none"> • 7G The Particle Model • 7I Energy 	<p>8F Periodic Table</p> <p>KS2:</p> <ul style="list-style-type: none"> • compare and group materials on the basis of their properties • explain that some changes result in the formation of new materials, and that this kind 	<p>8B Plants & their Reproduction</p> <p>KS2:</p> <ul style="list-style-type: none"> • identify and describe the functions of different parts of flowering plants • explore the requirements of plants for life and growth and how 	<p>8G Metals & their Uses</p> <p>KS2:</p> <ul style="list-style-type: none"> • compare and group together everyday materials on the basis of their properties • explain that some changes result in the formation of new materials, and that this kind of 	<p>7J Electrical Circuits</p> <p>KS2:</p> <p>(Knowledge below is likely to be patchy, assume none)</p> <ul style="list-style-type: none"> • construct simple circuits and use them to determine whether materials are conductors or insulators

		<ul style="list-style-type: none"> Understand that we need oxygen and glucose to release energy. Understand that the circulatory system carries oxygen and nutrients around the body. Be familiar with the concept of air pressure. <p>KS3: 7C Muscles & Bones</p>		<p>of change is not usually reversible</p> <p>KS3:</p> <ul style="list-style-type: none"> 7G The Particle Model 7H Atoms, Elements & Compounds 	<p>they vary from plant to plant</p> <ul style="list-style-type: none"> investigate the way in which water is transported within plants explore the part that flowers play in the life cycle of flowering plants. recognise that living things can be grouped in a variety of ways describe the life process of reproduction in some plants give reasons for classifying plants based on specific characteristics. <p>KS3:</p> <ul style="list-style-type: none"> 7B Sexual Reproduction in Animals 7D Ecosystems 	<p>change is not usually reversible</p> <p>KS3:</p> <p>7G The Particle Model</p> <p>7H Atoms, Elements & Compounds</p>	<ul style="list-style-type: none"> know how switches work draw circuit diagrams and construct circuits from diagrams using conventional symbols be able to investigate the effect of changing components in a circuit on the brightness of bulbs describe the effects of changing the voltage of a battery describe the effects of short circuits and the use of fuses. <p>No prerequisites from KS3 topics.</p>
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