

Science department - Year 8 scheme of work

National curriculum: https://www.gov.uk/government/publications/national-curriculum-in-england-science-programmes-of-study				
Term	Title	Unit content	Key vocabulary	Resource links:
Autumn one				
Week 1	Key concepts recap	<p>Key knowledge taught:</p> <ul style="list-style-type: none"> • Data and showing data – continuous and discrete • Plotting bar graphs with data given <p>Practical ideas:</p> <ul style="list-style-type: none"> • <p>Key skills developed:</p> <ul style="list-style-type: none"> • 		<u>Unit 1 Key concepts recap</u>
Week2	Key concepts recap	<p>Key knowledge taught:</p> <ul style="list-style-type: none"> • Practical which enables collection of data for a bar chart • Line graphs – looking at suitable scales for axes • Plotting graphs collect water / chocolate cooling curve data and plot <p>Practical ideas:</p> <ul style="list-style-type: none"> • Collect data – favourite ice-cream / bead colours / skittles / smarties colour / types of pasta and plot <p>Key skills developed:</p> <ul style="list-style-type: none"> • 		<u>Unit 1 Key concepts recap</u>

Week 3	Health and nutrition	<p>Key knowledge taught:</p> <ul style="list-style-type: none"> • Good and ill health. Cover WHO definition • Balanced human diet – look at different foods decide what group they belong to • Imbalances in diet – anaemia, rickets, scurvy Kwashiorkor – use powerpoint – blank worksheet for recap <p>Practical ideas:</p> <ul style="list-style-type: none"> • Practical ideas: Test for starch, fats, sugar, proteins • How much sugar is in food – look out different foods – weigh out the amount of sugar in these foods <p>Key skills developed:</p> <ul style="list-style-type: none"> • 		<u>Unit 2 Health and nutrition</u>
Week 4	Health and nutrition	<p>Key knowledge taught:</p> <ul style="list-style-type: none"> • Digestive system • Label digestive system • Digestive system continued • Energy in food <p>Practical ideas:</p> <ul style="list-style-type: none"> • Watch demo – food blender and tights (add food groups and enzymes model what happens as food travels through the body. Use model of torso • Carry out practical to show the amount of energy in food – use lit food to see how much the temp rises <p>Key skills developed:</p>		<u>Unit 2 Health and nutrition</u>

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Week 5	Disease	<p>Key knowledge taught:</p> <ul style="list-style-type: none"> • Communicable versus non-communicable disease • Pathogens - How we can prevent spread How our body protects us? • Non-communicable diseases and risk factors <p>Practical ideas:</p> <ul style="list-style-type: none"> • <p>Key skills developed:</p> <ul style="list-style-type: none"> • <p>Hinderland</p> <ul style="list-style-type: none"> • Covid 19 		<u>Unit 3 Disease</u>
Week 6	Chemical reactions (metals and acids)	<p>Key knowledge taught:</p> <ul style="list-style-type: none"> • Elements /compounds / mixture • Chemical and physical changes (over two lessons) • Acid and metal reactions – hydrogen test <p>Practical ideas:</p> <ul style="list-style-type: none"> • <p>Key skills developed:</p> <ul style="list-style-type: none"> • 	8 * *	<u>Unit 3 Disease</u>

Week 7	Chemical reactions (metals and acids)	Key knowledge taught: <ul style="list-style-type: none"> acid and metal reactions – word and symbol equations Metal reactions with oxygen and water Intro to balancing equations Practical ideas: <ul style="list-style-type: none"> Key skills developed: <ul style="list-style-type: none"> 		<u>Unit 4 Chemical reactions</u>
Autumn two				
Week 1	Chemical reactions (metals and acids)	Key knowledge taught: <ul style="list-style-type: none"> Reactivity series Metal displacement reactions Extracting metals Practical ideas: <ul style="list-style-type: none"> Key Skills developed: <ul style="list-style-type: none"> 		<u>Unit 4 Chemical reactions</u>
Assessment week				
Week 2	Chemical reactions	Key knowledge taught:		<u>Unit 4 Chemical reactions</u>

	(metals and acids)	<ul style="list-style-type: none"> • Practical ideas: <ul style="list-style-type: none"> • Key skills developed: <ul style="list-style-type: none"> • 		
Week 3	Static and current electricity	Key knowledge taught: <ul style="list-style-type: none"> • Electrostatic charges • Static discharge (van der graff, lightening etc) • Current and charge Practical ideas: <ul style="list-style-type: none"> • Key skills developed: <ul style="list-style-type: none"> • 		<u>Unit 5 Static and current electricity</u>
Week 4	Static and current electricity	Key knowledge taught: <ul style="list-style-type: none"> • Series and parallel circuits • Current and potential difference rules for series/parallel • Electrical resistance Practical ideas: <ul style="list-style-type: none"> • Key skills developed:		<u>Unit 5 Static and current electricity</u>

		<ul style="list-style-type: none"> • 		
Week 5	Magnetism and electromagnets	<p>Key knowledge taught:</p> <ul style="list-style-type: none"> • Resistance and length of a wire practical • Magnetic forces • Magnetic fields <p>Practical ideas:</p> <ul style="list-style-type: none"> • <p>Key skills developed:</p> <ul style="list-style-type: none"> • 		<u>Unit 6 Magnetism and electromagnetism</u>
Week 6	Magnetism and electromagnetism	<p>Key knowledge taught:</p> <ul style="list-style-type: none"> • Electromagnets investigation • Heredity and variation • Continuous variation <p>Practical ideas:</p> <ul style="list-style-type: none"> • <p>Key skills developed:</p> <ul style="list-style-type: none"> • 		<u>Unit 6 Magnetism and electromagnetism</u>

Week 7	Genetics and variation	Key knowledge taught: <ul style="list-style-type: none"> • DNA structure and the genome Practical ideas: <ul style="list-style-type: none"> • Key skills developed: <ul style="list-style-type: none"> • 		<u>Unit 7 Genetics and variation</u>
Week 8		Key knowledge taught: Practical ideas: <ul style="list-style-type: none"> • Key skills developed: <ul style="list-style-type: none"> • 		
Assessment point (this can be moved) - NewY8AutumnAssessment.rtf				
Spring one				
Week 1	Exothermic and endothermic reactions	Key knowledge taught: <ul style="list-style-type: none"> • Types of chemical reaction (chemical changes recap) • Conservation of mass • Combustion Practical ideas:		<u>Unit 8 Exothermic and endothermic reactions</u>

		<ul style="list-style-type: none"> • <p>Key skills developed:</p> <ul style="list-style-type: none"> • 		
Week 2	Exothermic and endothermic reactions	<p>Key knowledge taught:</p> <ul style="list-style-type: none"> • Thermal decomposition • Exothermic and endothermic reactions (use double lesson for this) • Catalysts <p>Practical ideas:</p> <ul style="list-style-type: none"> • <p>Key skills developed:</p> <ul style="list-style-type: none"> • 		<u>Unit 8</u> <u>Exothermic and endothermic reactions</u>
Week 3	Photosynthesis and respiration	<p>Key knowledge taught:</p> <ul style="list-style-type: none"> • Photosynthesis • Factors affecting photosynthesis • Leaf structure <p>Practical ideas:</p> <ul style="list-style-type: none"> • <p>Key skills developed:</p>		<u>Unit 9</u> <u>Photosynthesis and respiration</u>

		<ul style="list-style-type: none"> • 		
Week 4	Photosynthesis and respiration	<p>Key knowledge taught:</p> <ul style="list-style-type: none"> • Plant minerals and deficiencies • Aerobic respiration • Anaerobic respiration in humans <p>Practical ideas:</p> <ul style="list-style-type: none"> • <p>Key skills developed:</p> <ul style="list-style-type: none"> • 		<u>Unit 9 Photosynthesis and respiration</u>
Week 5	Photosynthesis and respiration	<p>Key knowledge taught:</p> <ul style="list-style-type: none"> • Anaerobic respiration in plants and yeast (fermentation) • Consolidation <p>Practical ideas:</p> <ul style="list-style-type: none"> • <p>Key skills developed:</p> <ul style="list-style-type: none"> • 		<u>Unit 9 Photosynthesis and respiration</u>
Week 6	Speed, acceleration and	<p>Key knowledge taught:</p> <ul style="list-style-type: none"> • Speed • Speed calculations 		<u>Unit 10 Speed, acceleration</u>

	motion graphs	<ul style="list-style-type: none"> Distance-time graphs 		<u>and motion graphs</u>
Spring two				
Week 1	Speed, acceleration and motion graphs	<p>Key knowledge taught:</p> <ul style="list-style-type: none"> Gradients on distance-time graphs Acceleration Speed-time graphs <p>Practical ideas:</p> <ul style="list-style-type: none"> <p>Key skills developed:</p> <ul style="list-style-type: none"> 		<u>Unit 10 Speed, acceleration and motion graphs</u>
Week 2	Speed, acceleration and motion graphs	<p>Key knowledge taught:</p> <ul style="list-style-type: none"> Stopping distances Revision <p>Practical ideas:</p> <ul style="list-style-type: none"> <p>Key skills developed:</p> <ul style="list-style-type: none"> 		<u>Unit 10 Speed, acceleration and motion graphs</u>

Week 3	Consolidation / Revision			
Week 4	SCIENCE WEEK			
Week 5	Pressure and moments	<p>Key knowledge taught:</p> <ul style="list-style-type: none"> • Weight as a force (to introduce idea of pressure as distinct from force only) • Pressure with solids • Gas pressure <p>Practical ideas:</p> <ul style="list-style-type: none"> • <p>Key skills developed:</p> <ul style="list-style-type: none"> • 		<u>Unit 11 Pressure and moments</u>
Week 6	Pressure and moments	<p>Key knowledge taught:</p> <ul style="list-style-type: none"> • Atmospheric pressure • Pressure in a liquid • Turning forces <p>Practical ideas:</p> <ul style="list-style-type: none"> • Getting kids to step into massive bin bags and use vacuum to remove air in the bag – enables them to feel the weight of the atmosphere <p>Key skills developed:</p>		<u>Unit 11 Pressure and moments</u>

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Assessment 2		Can be moved: NewY8SpringAssessment.doc or NewY8SpringAssessment.doc.rtf		
Summer one				
Week 1	Water, carbon and nitrogen cycles	<p>Key knowledge taught:</p> <ul style="list-style-type: none"> • Water cycle and link to potable water (the idea of recycling/conservation of mass is key here to differentiate from KS2) • Making water potable • Nitrogen cycle <p>Practical ideas:</p> <ul style="list-style-type: none"> • <p>Key skills developed:</p> <ul style="list-style-type: none"> • 		<p><u>Unit 12</u> <u>Water, carbon and nitrogen cycles</u></p> <p><u>Biology</u> <u>Paper 1 -</u> <u>Plants and</u> <u>Ecosystems</u></p>
Week 2	Atmosphere and climate change	<p>Key knowledge taught:</p> <ul style="list-style-type: none"> • Carbon cycle • The earth's early atmosphere • The earth's (natural) atmosphere evolution <p>Practical ideas:</p> <p>Key skills developed:</p>		<p><u>Unit 13</u> <u>Atmosphere and climate</u></p> <p><u>Biology</u> <u>Paper 1 -</u> <u>Plants and</u> <u>Ecosystems</u></p> <p><u>Unit 3 -</u> <u>Chemistry in</u> <u>our world</u></p>

Week 3	Climate change and ecosystems	Key knowledge taught: <ul style="list-style-type: none"> • The earth's modern atmosphere (man-made climate change) • Effects of climate change Practical ideas: <ul style="list-style-type: none"> • Key skills developed: <ul style="list-style-type: none"> • 		<u>Unit 3 - Chemistry in our world</u>
Week 4	Ecosystems and biodiversity	Key knowledge taught: <ul style="list-style-type: none"> • Food webs and concept of biomass • Trophic levels and interdependence • Competition for resources Practical ideas: <ul style="list-style-type: none"> • Key skills developed: <ul style="list-style-type: none"> • 		<u>Unit 14 Biodiversity and ecosystems</u> <u>(NO CONTENT)</u>

Week 5	Ecosystems and biodiversity	<p>Key knowledge taught:</p> <ul style="list-style-type: none"> • Natural selection and evolution • Extinction • Measuring population (quadrats) <p>Practical ideas:</p> <ul style="list-style-type: none"> • <p>Key skills developed:</p> <ul style="list-style-type: none"> • 		<u>Autumn 1 - Biology Paper 1</u>
Week 6	Biodiversity	<p>Key knowledge taught:</p> <ul style="list-style-type: none"> • Biodiversity • Factors that affect biodiversity (deforestation, fertilisers and chemicals on crops etc) <p>Practical ideas:</p> <ul style="list-style-type: none"> • <p>Key skills developed:</p> <ul style="list-style-type: none"> • 		<u>Ecology - Biodiversity and Human Interaction</u>
Week 7				
Summer two				

Week 1	Energy stores and transfers	<p>Key knowledge taught:</p> <ul style="list-style-type: none"> • Concept of energy (that it is a metaphor for what we can “do work” with – just like how monetary value allows us to buy things, but is found in different forms) • 8 energy stores • Transferring energy (sankey diagrams) <p>Practical ideas:</p> <ul style="list-style-type: none"> • <p>Key skills developed:</p> <ul style="list-style-type: none"> • 		<p>Energy booklet: 7pe-energy.docx</p> <p>Energy Mastery booklet: energy-mastery-booklet.docx</p> <p>Unit 15 Energy stores and transfers</p>
Week 2	Energy stores and transfers	<p>Key knowledge taught:</p> <ul style="list-style-type: none"> • Thermal energy and temperature • Conduction • Convection (use double lesson for this because requires a reteaching of density) <p>Practical ideas:</p> <ul style="list-style-type: none"> • <p>Key skills developed:</p>		<p>Unit 15 Energy stores and transfers</p>
Week 3	Consolidation / revision			

Week 4	Energy	<p>Key knowledge taught:</p> <ul style="list-style-type: none"> • Power and relationship to energy • Energy and fuel • Fossil fuels <p>Practical ideas:</p> <ul style="list-style-type: none"> • <p>Key skills developed:</p> <ul style="list-style-type: none"> • 		<u>Unit 15 Energy stores and transfers</u>
Week 5	Energy resources	<p>Key knowledge taught:</p> <ul style="list-style-type: none"> • Inside a fossil fuel power station • Wind turbines (construction kits) • Tidal and wave power <p>Practical ideas:</p> <ul style="list-style-type: none"> • <p>Key skills developed:</p> <ul style="list-style-type: none"> • 		<u>Unit 16 Energy resources</u> <u>NO CONTENT</u>
Week 6	Energy resources	<p>Key knowledge taught:</p> <ul style="list-style-type: none"> • Hydroelectric power • Geothermal and solar power 		NO CONTENT

		<ul style="list-style-type: none"> • Nuclear power <p>Practical ideas:</p> <ul style="list-style-type: none"> • <p>Key skills developed:</p> <ul style="list-style-type: none"> • 		
Week 7				
Assessment 3 – assessment date can be moved NewY8SummerAssessment.doc or NewY8SummerAssessment.doc.rtf				