



Science

CURRICULUM OVERVIEW – YEAR 8 (KS3)

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Curriculum Overview

Subject: KS3 Science

Year group	Topic and length	Key Words	Key Skills	Assessments	Cultural Capital	Links to NC and Spec
8	9. Ecosystem (Part 1) 12 hours	Anther Bioaccumulation Carpel Community Competition Consumer Ecosystem Fertilisation Food chain / web Germination Habitat Interdependence Ovary Ovule Petal Predator Prey Producer Pollen Pollination Population Seed Sepal Stamen Stigma Style	<ul style="list-style-type: none"> • Data interpretation • Analysing graphs • Analysing models • Communicate ideas • Numeracy 	<p>~45 mark end of topic test with review action points for pupils to act on upon reflection</p> <p>Think pink/go green task to measure the understanding of topic key skills.</p> <p>Weekly Seneca homework to review concepts from this topic.</p>	<ul style="list-style-type: none"> • How are seeds made? • Why is it important that we care about the variety of species on our planet? • How can we help protect the species on our planet? • Why are pollinator species such as insects and bats so important? • Where does our 	<ul style="list-style-type: none"> • reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, including quantitative investigation of some dispersal mechanisms. • the interdependence of organisms in an ecosystem, including food webs and insect pollinated crops • the importance of plant reproduction through insect pollination in human food security • how organisms affect, and are affected by, their environment, including the accumulation of toxic materials.

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					food and chemical energy come from?	
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8	6. Reactions (Part 1) 12 hours	Acid Acidic Alkali Alkaline Base Chemical Chemical reaction Concentration Corrosive Displacement Hydroxide Indicator Irritant Neutral Neutralisation Oxide Oxidation pH scale reversible reactivity Reactivity series salt strong acid Universal indicator Weak acid	<ul style="list-style-type: none"> Variable planning Practical skills Maths skills Evaluating and identifying risks. Present data Collect data Draw limitations Analyse patterns 	<p>~45 mark end of topic test with review action points for pupils to act on upon reflection</p> <p>Think pink/go green task to measure the understanding of topic key skills.</p> <p>Weekly Seneca homework to review concepts from this topic.</p>	<ul style="list-style-type: none"> What is an acid? What is an alkali? What examples of acids and alkalis are in our everyday lives? How can we test the strength of acids and alkalis? What are the risks and dangers involved with using acids and alkali? 	<ul style="list-style-type: none"> defining acids and alkalis in terms of neutralisation reactions the pH scale for measuring acidity/alkalinity; and indicators reactions of acids with metals to produce a salt plus hydrogen reactions of acids with alkalis to produce a salt plus water chemical reactions as the rearrangement of atoms representing chemical reactions using formulae and using equations

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					<ul style="list-style-type: none"> How are salts made? 	
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8	4. Waves (Part 1) 12 hours	Amplitude Angle of incidence Angle of reflection Auditory canal Auditory nerve Eardrum Frequency Hertz Law of reflection Lens Longitudinal Normal Oscillation Oscilloscope Peak Photoreceptors Primary colour Refraction Secondary colour Transverse Trough	Analysis and interpretation of data and information. Graph interpretation, numeracy, drawing graphs, unit conversion, re-arranging equations. Scientific diagrams, making predictions. Planning and conducting practicals.	~45 mark end of topic test with review action points for pupils to act on upon reflection Think pink/go green task to measure the understanding of topic key skills. Weekly Seneca homework to review concepts from this topic.	Understand how we hear sounds and how echoes work. Understand how we see and how light behaves. How do mirrors work? Understand what colour is and how it is related to light. Understand how problems to our hearing and vision can occur. What examples of waves are	<ul style="list-style-type: none"> frequencies of sound waves, measured in hertz (Hz); echoes, reflection and absorption of sound sound needs a medium to travel, the speed of sound in air, in water, in solids sound produced by vibrations of objects, in loud speakers, detected by their effects on microphone diaphragm and the ear drum; sound waves are longitudinal auditory range of humans and animals. the similarities and differences between light waves and waves in matter light waves travelling through a vacuum; speed of light

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		Ultrasound Wave Wavelength			there in our everyday lives?	<ul style="list-style-type: none"> the transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface colours and the different frequencies of light, white light and prisms (qualitative only); differential colour effects in absorption and diffuse reflection
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8	8. Organisms (Part 2) 12 hours	Addiction Balanced diet Carbohydrate Carbohydrase Catalyst Deficiency Drug Enzyme Exhale Fibre Gas exchange Inhale Lipid Medicinal drug Mineral Nutrient Protease Protein	<ul style="list-style-type: none"> Evaluate models of breathing and digestion. Interpretation of models. Communicate ideas. Justify opinions. 	<p>~45 mark end of topic test with review action points for pupils to act on upon reflection</p> <p>Think pink/go green task to measure the understanding of topic key skills.</p> <p>Weekly Seneca homework to review concepts from this topic.</p>	<p>Why do we need a digestive system?</p> <p>Why do we need a respiratory system?</p> <p>What is a drug?</p> <p>How can drugs affect the respiratory and digestive system?</p> <p>Why do we need minerals,</p>	<ul style="list-style-type: none"> the effects of recreational drugs (including substance misuse) on behaviour, health and life processes. the structure and functions of the gas exchange system in humans, including adaptations to function the mechanism of breathing to move air in and out of the lungs, using a pressure model to explain the movement of gases, including

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		Recreational drug Respiration Respiratory system Vitamin			vitamins and other nutrients?	simple measurements of lung volume <ul style="list-style-type: none">the impact of exercise, asthma and smoking on the human gas exchange system , the role of leaf stomata in gas exchange in plants.content of a healthy human diet: carbohydrates, lipids (fats and oils), proteins, vitamins, minerals, dietary fibre and water, and why each is neededcalculations of energy requirements in a healthy daily dietthe consequences of imbalances in the diet, including obesity, starvation and deficiency diseasesthe tissues and organs of the human digestive system, including adaptations to function and how the digestive system digests food
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8	1. Forces (Part 2) 12 hours	Air resistance Atmospheric pressure Contact force Drag Elastic limit Equilibrium Extension Friction Gas pressure Hooke's Law Incompressible Linear relationship Moment Newton Pivot Pressure Resultant force stress	<ul style="list-style-type: none"> Analyse patterns Draw conclusions Discuss limitations. Construct explanations Collect data Practical skills Numeracy Calculations and re-arranging equations. 	<p>~45 mark end of topic test with review action points for pupils to act on upon reflection</p> <p>Think pink/go green task to measure the understanding of topic key skills.</p> <p>Weekly Seneca homework to review concepts from this topic.</p>	<ul style="list-style-type: none"> What is pressure? What is elasticity? Why are certain modes of transport shaped the way they are? How are certain experiences such as bungee jumps and the suspension in cars considered to be safe? How does the concept of pressure (including liquid and atmospheric) explain certain phenomena that we take for granted? 	<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 Pressure in fluids atmospheric pressure, decreases with increase

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						<p>of height as weight of air above decreases with height</p> <ul style="list-style-type: none">• pressure in liquids, increasing with depth; upthrust effects, floating and sinking• pressure measured by ratio of force over area – acting normal to any surface. Balanced forces• opposing forces and equilibrium: weight held by stretched spring or supported on a compressed surface. Forces and motion• forces being needed to cause objects to stop or start moving, or to change their speed or direction of motion (qualitative only)• change depending on direction of force and its size.
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8	5. Matter (Part 2) 12 hours	Atom Atomic model Element Compound Mixture Chemical symbol Formulae Conservation of mass Chemical reaction Periodic table Mendeleev Groups Periods Metals Non-metals Metal oxide Non-metal oxide Alkali metals Halogens Noble gases Properties Reactivity	<ul style="list-style-type: none"> Analyse patterns Discuss limitations Draw conclusions Present data Communicate ideas Estimate risks Review theories Construct explanations 	<p>~45 mark end of topic test with review action points for pupils to act on upon reflection</p> <p>Think pink/go green task to measure the understanding of topic key skills.</p> <p>Weekly Seneca homework to review concepts from this topic.</p>	<p>What is everything made of?</p> <p>What is an element?</p> <p>How can the same element have different properties when joined with another element?</p> <p>How and why are the elements arranged in the periodic table?</p> <p>How are groups of elements different from one another?</p>	<ul style="list-style-type: none"> a simple (Dalton) atomic model differences between atoms, elements and compounds chemical symbols and formulae for elements and compounds conservation of mass changes of state and chemical reactions the varying physical and chemical properties of different elements the principles underpinning the Mendeleev Periodic Table the Periodic Table: periods and groups; metals and non-metals how patterns in reactions can be predicted with reference to the Periodic Table the properties of metals and non-metals the chemical properties of metal and non-metal oxides with respect to acidity

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8	10. Genes (Part 2) 12 hours	Allele Biodiversity Characteristic Chromosome Competition DNA Dominant Evolution Extinction Fossil record Gene Genetic modification Mutation Natural selection Population Punnet square Recessive	<ul style="list-style-type: none"> Construct explanations Critique ideas and explanations Draw explanations Justify opinions Review theories Draw conclusions Interpret diagrams and models 	<p>~45 mark end of topic test with review action points for pupils to act on upon reflection</p> <p>Think pink/go green task to measure the understanding of topic key skills.</p> <p>Weekly Seneca homework to review concepts from this topic.</p>	<p>How does genetics affect appearance and the diversity of species?</p> <p>Why should we care about conserving species?</p> <p>What causes a species to go extinct?</p> <p>How have species changed over time?</p> <p>How do we know what extinct species looked like?</p> <p>Why do we look like our parents?</p> <p>Why do we look different from others?</p>	<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 and DNA in heredity, including the part played by Watson, Crick, Wilkins and Franklin in the development of the DNA model differences between species the variation between individuals within a species being continuous or discontinuous, to include measurement and graphical representation of variation the variation between species and between individuals of the same species means some organisms compete more successfully, which can drive natural selection changes in the environment may leave individuals within a

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						<p>species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction</p> <ul style="list-style-type: none"> the importance of maintaining biodiversity and the use of gene banks to preserve hereditary material
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8	2. Electromagnets (Part 2) 12 hours	Magnet Electromagnet Magnetic field Magnetic field lines Compass Attraction Repulsion Earth's magnetic field Current D.C. motor Solenoid	<ul style="list-style-type: none"> Analyse patterns Draw conclusions Present data Numeracy Graph skills Present data Communicate ideas Construct explanations 	<p>~45 mark end of topic test with review action points for pupils to act on upon reflection</p> <p>Think pink/go green task to measure the understanding of topic key skills.</p>	<p>How does magnetism link to ideas of electricity?</p> <p>What factors affect magnetism?</p> <p>What is an electromagnet?</p>	<ul style="list-style-type: none"> magnetic poles, attraction and repulsion magnetic fields by plotting with compass, representation by field lines Earth's magnetism, compass and navigation the magnetic effect of a current, electromagnets, D.C. motors (principles only).

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		Coils Iron core North-seeking South-seeking	<ul style="list-style-type: none">• Devise questions• Collect ideas• Plan variables• Test hypothesis• Estimate risks	Weekly Seneca homework to review concepts from this topic.	How are magnets and electromagnets used in our everyday lives? How can we increase the strength of an electromagnet? How is the Earth similar to a magnet?	
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