



Science Curriculum Knowledge Map- Year 9



Threshold knowledge	Core knowledge
<p>B1 Cell biology</p> <ul style="list-style-type: none"> • Animal & plant cells • Levels of organisation • How to use a microscope • Specialised cells • Variation • Bacteria and enzymes in digestion • Movement of substances- diffusion 	<p>B1 Cell biology</p> <ul style="list-style-type: none"> • Eukaryotic & prokaryotic cells. • Order of magnitude. • Microscopy. • Cell specialisation and cell differentiation. • Stem cells. • Chromosomes, mitosis and cell cycle. • Culturing microorganisms. • Diffusion. • Osmosis. • Active transport.
<p>C1 Atomic structure and the periodic table</p> <ul style="list-style-type: none"> • Chemical formulae • Atoms, elements and compounds. • Mixtures • Particle model • Periodic table • Group 0- noble gases • Group 1- Alkali metals • Group 7- Halogens 	<p>C1 Atomic structure and the periodic table</p> <ul style="list-style-type: none"> • Balancing equations. • Atoms, elements and compounds. • Mixtures • Atomic structure. • Electronic structure. • The development of the model of the atom. • The periodic table. • The development of the periodic table. • Metals and non-metals. • Group 0. • Group 1. • Group 7. • Transition metals.
<p>P1 Energy</p> <ul style="list-style-type: none"> • Fuels • Energy resources • Energy transfers • Energy & temperature • Energy & power • Energy dissipation & efficiency • Insulation 	<p>P1 Energy</p> <ul style="list-style-type: none"> • Energy stores and systems. • Changes in energy - kinetic energy, elastic potential energy and gravitational potential energy. • Specific heat capacity. • Power. • Energy transfers in a system (dissipation of energy). • Thermal insulation. • Efficiency. • National and global energy resources.
<p>B2 Organisation</p> <ul style="list-style-type: none"> • Digestive system • Food tests • Bacteria and enzymes in digestion • Levels of organisation • Gas exchange • Breathing • Smoking • Drugs • Alcohol • Unhealthy diet • Respiration • Photosynthesis • Plant leaves • Plant minerals 	<p>B2 Organisation</p> <ul style="list-style-type: none"> • The human digestive system. • Food testing. • Enzymes. • The heart. • Blood vessels. • Gas exchange. • Blood. • Coronary heart disease. • Health issues (non-communicable diseases). • Cancer. • Plant tissues and plant organ systems. • Transpiration. • Translocation. • Stomata.
<p>C2 Bonding, structure and properties of matter</p> <ul style="list-style-type: none"> • Atoms in chemical reactions • Combustion • Thermal decomposition • Conservation of mass • Particle model • States of matter • Chemical reactions • Chemical reactions of metals & non-metals • Polymers 	<p>C2 Bonding, structure and properties of matter</p> <ul style="list-style-type: none"> • Ionic bonding. • Ionic compounds. • Covalent bonding. • Properties of bonding. • Graphenes and fullerenes. • Metallic bonding. • The three states of matter. • Polymers. • Nanoparticles.
<p>P2 Electricity</p> <ul style="list-style-type: none"> • Circuit components and their symbols • Potential difference • Resistance • Series & parallel circuits • Current • Charges- electric fields 	<p>P2 Electricity</p> <ul style="list-style-type: none"> • Circuit symbols. • Electrical charge and current. • Current, resistance and potential difference. • Series and parallel circuits. • Resistors. • I-V characteristics. • Thermistors, LDR and LED. • Mains electricity. • Power and energy transfers. • The National Grid. • Static electricity. • Electric fields.



Science Curriculum Knowledge Map- Year 8



Threshold knowledge	Core knowledge
<p>Electricity</p> <ul style="list-style-type: none"> • Circuit diagrams. • Current in series and parallel circuits. • Voltage in series and parallel circuits. • Resistance. • Electrical conductors and insulators. • Magnetism. • Static electricity. • Electromagnets. 	<p>Electricity</p> <ul style="list-style-type: none"> • Circuits. • Modelling circuits. • Measuring voltage. • Series circuits. • Parallel circuits. • Resistance. • Magnets. • Electromagnets. • Static electricity.
<p>Energy</p> <ul style="list-style-type: none"> • Types of energy. • Fossil fuels. • Burning fuels. • Renewable energy resources. • Non-renewable energy resources. • Cost of electricity. • Thermal energy. 	<p>Energy</p> <ul style="list-style-type: none"> • Energy stores. • Food as fuels. • Work done and power. • Conductors and insulators. • Conduction. • Convection. • Radiation. • Energy resources.
<p>Matter</p> <ul style="list-style-type: none"> • Particles. • Solids, liquids and gases. • Changing states. • Mixtures and solutions. • Separating mixtures. • Extracting rock from salt rock. • Distillation. • Chromatography. 	<p>Matter</p> <ul style="list-style-type: none"> • Atoms, elements and molecules. • The periodic table. • Group 1. • Group 7. • Group 0. • Elements. • Atoms. • Compounds. • Basic molecules. • Electron configuration. • Chemical equations.
<p>Reactions</p> <ul style="list-style-type: none"> • Reading the periodic table. • Metals and non-metals. • Chemical and physical changes. • Making and naming compounds. • Reacting metals with acids. • Reacting metals with oxygen. • Combustion reactions. • Reactivity series. • Thermal decomposition reactions. 	<p>Reactions</p> <ul style="list-style-type: none"> • Chemical and physical reactions. • Acids and alkalis. • Indicators. • Neutralisation. • Endothermic and exothermic reactions.
<p>Earth</p> <ul style="list-style-type: none"> • Volcanoes. • Igneous rocks. • Sedimentary rocks. • Metamorphic rocks. • Rock cycle. 	<p>Earth</p> <ul style="list-style-type: none"> • The Earth's atmosphere. • Greenhouse effect and global warming. • Fossil fuels. • Carbon cycle. • Natural resources. • Recycling. • The night sky. • Our solar system. • Geocentric and heliocentric. • Phases of the moon. • Day and night. • Seasons. • The Big Bang Theory.
<p>Organisms</p> <ul style="list-style-type: none"> • Skeleton. • Joints. • Muscles. • Body organs. • Microscopes. • Animal cells. • Plant cells. • Specialised cells. • Unicellular organisms. 	<p>Organisms</p> <ul style="list-style-type: none"> • The lungs. • Breathing. • Gas exchange. • Smoking and asthma. • Aerobic respiration. • Anaerobic respiration. • Fermentation. • Food groups and balanced diet. • The digestive system. • The blood.
<p>Ecosystem</p> <ul style="list-style-type: none"> • Classification of plants and animals. • The environment. • Population and feeding relationships. • Food chains and food webs. • Pyramids of biomass. • Reproduction in plants. • Pollination. • Seed dispersal. 	<p>Ecosystem</p> <ul style="list-style-type: none"> • Photosynthesis. • Rate of photosynthesis. • Plant adaptations. • Stomata. • Aerobic respiration. • Anaerobic respiration. • Yeast fermentation.
<p>Genes</p> <ul style="list-style-type: none"> • Reproductive system. • History of reproduction. • Adaptations of sperm and egg cells. • Menstrual cycle. • How does the foetus develop over time. • Birth. • Genes. 	<p>Genes</p> <ul style="list-style-type: none"> • Evolution. • Extinction. • Genes and inheritance. • Passing on genes. • Cloning and gene therapy. • The history of genetics.



Science Curriculum Knowledge Map- Year 7



Threshold knowledge	Core knowledge
<p>Forces</p> <ul style="list-style-type: none"> Contact forces and forces acting within a distance Objects fall towards the Earth due to Gravity Types of forces and how they work 	<ul style="list-style-type: none"> The different types of forces. Resultant forces. Friction. Hooke's Law. Moments. Pressure in liquids. Pressure in gases.
<p>Electricity</p> <ul style="list-style-type: none"> Circuit diagrams Series circuits Metals conduct electricity Working safely with electricity Common appliances that run on electricity 	<ul style="list-style-type: none"> Circuit diagrams and building circuits. Current in series and parallel circuits. Voltage in series and parallel circuits. Resistance. Electrical conductors and insulators. Magnetism. Static electricity. Electromagnets.
<p>Energy</p> <ul style="list-style-type: none"> Types of energy sources Energy sources that are used up and cannot be replaced 	<ul style="list-style-type: none"> Types of energy. Fossil fuels. Burning fuels. Renewable energy resources. Non-renewable energy resources. Cost of electricity. Thermal energy.
<p>Waves</p> <ul style="list-style-type: none"> Light travels in straight lines Light travels from the light source to object then eyes Exploring rainbows and objects looking bent in water How sounds are made How vibrations travel through a medium to the ear 	<ul style="list-style-type: none"> Wave diagrams. How sound travels. The ear. Properties of a wave. Reflection of light waves. Refraction of light waves. Dispersion of light waves to produce colour.
<p>Matter</p> <ul style="list-style-type: none"> Solids, liquids and gases Descriptions of states of matter 	<ul style="list-style-type: none"> Particles. Solids, liquids and gases. Changing states. Mixtures and solutions. Separating mixtures. Extracting rock from salt rock. Distillation. Chromatography.
<p>Reactions</p> <ul style="list-style-type: none"> Group materials based on properties Separation of mixtures Chemical reactions 	<ul style="list-style-type: none"> Reading the periodic table. Metals and non-metals. Chemical and physical changes. Making and naming compounds. Reacting metals with acids. Reacting metals with oxygen. Combustion reactions. Reactivity series. Thermal decomposition reactions.
<p>Earth</p> <ul style="list-style-type: none"> Types of rocks How fossils form within rocks How rocks form 	<ul style="list-style-type: none"> Volcanoes. Igneous rocks. Sedimentary rocks. Metamorphic rocks. Rock cycle.
<p>Organisms</p> <ul style="list-style-type: none"> Circulatory system Impact of diet, exercise and drugs on the body 	<ul style="list-style-type: none"> Skeleton. Joints. Muscles. Body organs. Microscopes. Animal cells. Plant cells. Specialised cells. Unicellular organisms.
<p>Ecosystem</p> <ul style="list-style-type: none"> Life cycle of plants Adaptation of plants Adaptation leads to evolution 	<ul style="list-style-type: none"> Classification of plants and animals. The environment. Population and feeding relationships. Food chains and food webs. Pyramids of biomass. Reproduction in plants. Pollination. Seed dispersal.
<p>Genes</p> <ul style="list-style-type: none"> Living things produce offspring that are not identical to their parents Types of reproduction Life cycle of animals 	<ul style="list-style-type: none"> Reproductive System. History of reproduction. Adaptations of sperm and egg cells. Menstrual cycle. How does the foetus develop over time. Birth. Genes.