

Curriculum Knowledge Map - Science



Year 9	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
<p>Declarative <i>What should they know?</i></p>	<p>Energy</p> <p>Energy stores Energy transfers Energy efficiency Energy dissipation Power Energy costs Power stations Non renewable energy Renewable energy Evaluating energy sources.</p>	<p>Cellular Processes</p> <p>Cells Types of cells Cell differentiation and growth Stem cells Diffusion and active transport in cells Osmosis in cells Investigating osmosis in cells Aerobic and anaerobic respiration in cells systems</p>	<p>Earth Science</p> <p>The Earth's early atmosphere The modern atmosphere Human effects on the atmosphere Global warming Using the Earth's resources sustainably Clean water</p>	<p>Energy efficiency work and power</p> <p>Power work Conservation and dissipation of energy. Energy transfers in a system Efficiency Specific heat capacity</p>	<p>Nutrition, digestion and health</p> <p>Cells to tissues Digestive enzymes and digestion Investigating enzymes in digestion Health issues Lifestyle choices Cancer The heart and blood vessels Components of the blood Coronary heart disease</p>	<p>Matter and the periodic table</p> <p>Atoms, elements and compounds Mixtures The development of the model of the atom Relative electrical charges of subatomic particles Size and mass of atoms Relative atomic mass Electronic structure</p>
<p>Procedural <i>What should they be able to do?</i></p>	<p>Carry out practical's to look at changes in;</p> <ul style="list-style-type: none"> kinetic (Ek), Elastic (Ee) Gravitational (Ep) energy; <p>Understand how we can convert energy stores into different forms</p> <p>Study the National Grid - how electrical energy is generated and distributed.</p> <p>Evaluation of energy resources using data</p>	<p>Be able to draw and label Eukaryotic and prokaryotic cells;</p> <p>Know the common and differing organelles for eukaryotic and prokaryotic cells;</p> <p>Explain the need for stem cells and cell differentiation in plants and animals;</p> <p>Understand that substances need to move into and out of cells, being able to explain diffusion, osmosis and active</p>	<p>Explain the evolution of and what is responsible for the changes in the earths early atmosphere to the present time;</p> <p>Recognise what gases are greenhouse gases and how they are currently affecting the average temperature of our atmosphere and ultimately changing our climate;</p> <p>Explain the effects of other gases that are also polluting our atmosphere;</p> <p>Be able to make decisions on how we access and use the earth's resources, including</p>	<p>Be able to explain transfers of energy;</p> <p>Calculate Work Done from the formula $W=Fs$;</p> <p>Calculate power using $P=E/t$;</p> <p>Calculate efficiency using $Eff = \frac{\text{Energy in}}{\text{Energy out}}$</p> <p>Investigate the changing of thermal energy transfers using various insulators and emitters;</p> <p>Complete an investigation into thermal conductivity;</p>	<p>Be able to tests foods for; starch using potassium iodide, protein using biurets reagent, glucose using benedict's reagent fats using ethanol / paper.</p> <p>Explain the action of enzymes using the lock and key method;</p> <p>Know what foods contribute to a healthy diet;</p> <p>How to lead a healthy lifestyle considering diet and exercise;</p>	<p>Know the details of all subatomic particles, their location, mass and charge;</p> <p>Be able to explain the difference between elements and compounds;</p> <p>Be able to name various compounds;</p> <p>Understand how elements are arranged on the current periodic table and know how it has developed over a number of years based on evidence;</p>

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	<p>Analyse advantages and disadvantages of renewable energy.</p> <p>Students will build a model power station in groups and present. They will also discuss the issues of non renewable.</p> <p>Recall and apply the following equations: $KE = \frac{1}{2} mv^2$ $GPE = mgh$</p> <p>Use of prefixes;</p> <ul style="list-style-type: none"> kilo, mega, giga. 	<p>transport, complete a practical on diffusion.</p>	<p>clean water, in a sustainable way for future generations;</p> <p>Know how to understand a LCA in terms of the cumulative effect of getting a product from manufacture to end of life and the effect this has on the planet.</p>	<p>Understand that the same quantities of different materials heat up by differing amounts when supplied with the same amount of energy (specific heat capacity.)</p>	<p>Know the structure of heart, arteries, veins and capillaries;</p> <p>How to reduce the risks of developing CHD and the effects of smoking and some diseases.</p>	<p>Explain how and why group 1 become more reactive down, and group 7 become more reactive up their respective groups;</p> <p>Know why group 0 is unreactive.</p>
<p>Disciplinary Literacy (Tier 3 Vocab)</p>	<ul style="list-style-type: none"> Renewable Non Renewable Finite Replenished Dissipation Nuclear Hydroelectric Solar 	<ul style="list-style-type: none"> DNA Genome Variation Organisation Osmosis Diffusion Enzyme 	<ul style="list-style-type: none"> Sedimentary Igneous Metamorphic Erosion Compaction Atmosphere Climate change 	<ul style="list-style-type: none"> Watts Joules Power Kinetic Gravitational Thermal Energy stores Radiation Forces Electricity Efficiency Specific heat capacity 	<ul style="list-style-type: none"> Lipase Amylase Protease Carbohydrase Stomach Small intestine Diffusion Absorption Statins Cholesterol Benign Malignant Tumour / cancer 	<ul style="list-style-type: none"> Proton Neutron Electron Shells/energy levels Compound Ionic Covalent Evaporate Filtrate Solution Solvent Solute

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<p>ASSESSMENTS</p>	<p>Tiered Mid Point Assessment</p> <p>Energy 1</p> <p>Tiered End of topic assessment</p> <p>Energy 2</p>	<p>Tiered Mid Point Assessment</p> <p>Respiration and diffusion</p> <p>Tiered End of topic assessment</p> <p>Bioenergetics</p>	<p>Tiered Mid Point Assessment</p> <p>The Atmosphere</p> <p>Tiered End of topic assessment</p> <p>Purifying water</p> <p>Progress test</p> <p>Energy</p> <ul style="list-style-type: none"> Cellular processes 	<p>Tiered Mid Point Assessment</p> <p>Energy part 1</p> <p>Tiered End of topic assessment</p> <ul style="list-style-type: none"> Heat transfer 	<p>Tiered Mid Point Assessment</p> <p>Food tests</p> <p>Tiered End of topic assessment</p> <p>Health and diet</p>	<p>Tiered Mid Point Assessment</p> <p>Matter and periodic table 1</p> <p>Tiered End of topic assessment</p> <p>Matter and periodic table 2</p> <p>Progress test</p> <ul style="list-style-type: none"> Energy Cellular processes Earth Science Efficiency, Work and Power
<p>HOME LEARNING</p>	<p>Creative homework based on organisms' topics.</p> <p>Comprehension exercise on famous people – Greta Thunberg</p> <p>4 educake quizzes of between 10 and 20 marks on energy.</p>	<p>Creative homework based on Acids and alkalis topic.</p> <p>Comprehension exercise on famous people – George Washington</p> <p>4 educake quizzes of between 10 and 20 marks on cellular processes.</p>	<p>Creative homework based on Waves, light and sound topic.</p> <p>Comprehension exercise on famous people: Sir Charles Kao</p> <p>4 educake quizzes of between 10 and 20 marks on Climate, the atmosphere and sustainability.</p> <p>Revision for the January progress test</p> <p>Energy</p> <p>Cellular processes</p>	<p>Creative homework based on Rocks, climate and the universe topic.</p> <p>Comprehension exercise on famous people: Neil deGrasse Tyson</p> <p>4 educake quizzes of between 10 and 20 marks on Energy efficiency work and power</p>	<p>Creative homework based on genes and evolution topic.</p> <p>Comprehension exercise on famous people: Rosalind Franklin</p> <p>4 educake quizzes of between 10 and 20 marks on Nutrition, digestion, and health</p>	<p>Creative homework based on Forces</p> <p>Comprehension exercise on famous people : Sally Ride</p> <p>4 educake quizzes of between 10 and 20 marks on Matter and the periodic table</p> <p>Revision for the summer progress test</p> <p>Energy</p> <p>Cellular processes</p> <p>Earth Science</p> <p>Efficiency, Work and Power</p>

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