



Curriculum map – Year 7 Science

YEAR 7	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
TOPIC(s)	Forces Particles	Particles Pure and impure substances	Atoms and the Periodic Table Energy	Energy Cells Chemical reactions - 1	Chemical reactions – 1 Bioenergetics	Bioenergetics Chemical reactions - 2

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What students will know	<p><u>Forces</u> What forces are and what forces do to objects. Examples of contact and non-contact forces. What a resultant force is and the effect of resultant forces on objects. Free body force diagrams. Speed is a measure of how much distance an object covers. A distance-time graph is used to represent the journey of moving objects.</p> <p><u>Particle model</u> The properties of the different states of matter (solid, liquid and gas) Changes of state in terms of the particle model.</p>	<p><u>Particle model</u> Conservation of mass Changes of state Simple diffusion in liquids and gases</p> <p><u>Pure and impure substances</u> Atoms, elements, compounds and mixtures. Identifying pure substances. Separation techniques</p>	<p><u>Atoms and the Periodic Table</u> All matter is made of atoms. The periodic table, its history, arrangement, groups, and trends in properties. Compounds have different properties to the elements they contain. Naming compounds. Process involved in writing and balancing simple symbol equations.</p> <p><u>Energy</u> Energy and the particle model. Internal energy is stored in materials.</p>	<p><u>Energy</u> How energy transfers from one store to another. Energy is always conserved.</p> <p><u>Cells</u></p> <p><u>Chemical reactions 1</u> No atoms are lost or made during a chemical reaction, they are just rearranged; mass is conserved. Metals have different reactivities and their reactions can create different products. Chemical tests can be performed on these products to identify them and some of their properties.</p>	<p><u>Chemical reactions 1</u> Chemical reactions can release thermal energy or require thermal energy from the surroundings. Interpreting data from an experiment can give evidence of this. That metals react with oxygen, which most of the time is an inconvenience. Metals are extracted in different ways and this depends on their reactivity.</p> <p><u>Bioenergetics</u> Organisation of multicellular organisms. The structure and functions of the gas exchange system in humans. The mechanism of breathing. The impact of exercise, asthma and smoking on the human gas exchange system. The role of leaf stomata.</p>	<p><u>Bioenergetics</u> The structure and functions of the human skeleton. Biomechanics – the interaction between skeleton and muscles. The function of muscles and examples of antagonistic muscles.</p> <p><u>Chemical reactions - 2</u> The pH scale and indicators. Reactions of acids with alkalis and with metals The chemical properties of metal and non-metal oxides Reactivity series Combustion, thermal decomposition, oxidation and displacement reactions The use of carbon in obtaining metals Exothermic and endothermic reactions. Catalysts.</p>

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What students will be able to do	<p><u>Forces</u> Identify forces acting on an object. Classify forces as contact and non-contact forces. Calculate resultant forces. Calculate speed. Draw and interpret distance – time graphs. Make predictions. Use data to draw conclusions</p> <p><u>Particle model</u> Explain the properties of solids, liquids and gases. Explain changes in physical states. Draw diagrams of particles. Plan and carry out scientific enquiries.</p>	<p><u>Particle model</u> Explain observations about mass for chemical or physical changes. Plan and carry out scientific enquiries. Make predictions.</p> <p><u>Pure and impure substances</u> Explain how substances dissolve. Use evidence from chromatography to identify unknown substances. Choose techniques to separate mixtures.</p>	<p><u>Atoms and the Periodic Table</u> Identify substances as atoms, molecules, elements, mixtures and compounds and draw particle model diagrams. Identify trends in the periodic table and predict properties of elements using the periodic table. Explain the properties of metals and non-metals.</p> <p><u>Energy</u> Explain changes of state with reference to internal energy and energy stores Identify the stores of energy objects have. Explain how energy can transfer from one store to another.</p>	<p><u>Energy</u> Describe changes between energy stores for real-life examples. Explain how energy is dissipated in a range of situations. Back up these explanations using calculations.</p> <p><u>Cells</u></p> <p><u>Chemical reactions 1</u> Use particle diagrams to illustrate what happens in a reaction and use these to demonstrate their knowledge of conservation of mass. Suggest reactions that may occur between two substances and link this back to metal reactivity. Identify products of reactions using chemical tests. Determine the pH of products.</p>	<p><u>Chemical reactions 1</u> State reactions exothermic and endothermic and interpret data from an experiment to evidence this. Explain the impact of metals oxidising and suggest ways to prevent oxidation. Describe how to extract metals from an ore using its reactivity.</p> <p><u>Bioenergetics</u> Explain how organ systems keep their cells alive. Explain how exercise, smoking and asthma affect the lungs Explain how parts of gas exchange systems are adapted to their function.</p>	<p><u>Bioenergetics</u> Explain observations about changes to breathing rate and volume. Explain how gases move in and out of the lung based on pressure differences.</p> <p><u>Chemical reactions - 2</u> Compare indicators and identify the most effective indicator. Explain uses of neutralisation and make a neutral solution. Describe oxidation, displacement, or metal acid reactions. Use particle diagrams to represent reactions. Identify an unknown element from its physical and chemical properties. Place unfamiliar metals into the reactivity series based on data. Identify reactions as exothermic or endothermic.</p>

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Assessment	Summative: Core questions assessment.	Summative: Core questions assessment.	Summative: Core questions assessment.	Summative: Core questions assessment.	Summative: Core questions assessment.	Summative: Core questions assessment.
Beyond the classroom	Research careers that have relevance to forces. For example: game designer, builder / architect,	Explore how diffusion is used in the perfume and air freshener industry. BBC Bitesize, lesson materials on google classroom. How chromatography is used in the wider world e.g. bank note fraud, pregnancy tests and covid tests.	Study rocket info to read Energy stores and transfers https://studyrocket.co.uk/revision/gcse-physics-combined-science-aqa/combined-trilogy-energy/energy-stores-and-systems		Look at Robert Hooke inventing the microscope and how microscopes have changed over time.	