



Prior Learning					
EYFS	KS1	LKS2			
<ul style="list-style-type: none"> • ELG - Explore the natural world around them, making observations and drawings. • Talk about what they see, using a wide vocabulary • Characteristics of liquids & solids e.g.melting chocolate • Explore collections of materials with similar and/or different properties • Use all their senses in hands-on exploration of natural materials • Use vocabulary to name specific features of the natural world, both natural & man-made 	<ul style="list-style-type: none"> • Describe the simple physical properties of a variety of everyday materials • Compare and group together a variety of everyday materials on the basis of their simple physical properties • Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses • Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching • Observe closely using simple equipment. • Gather and record data to help in answering questions. 	<ul style="list-style-type: none"> • Compare and group materials together, according to whether they are solids, liquids or gasses • Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C), • Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature • Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers. • Gather, record, classify and present data in a variety of ways to help in answering questions. 			
Chemistry - Materials	Learning Objective	Activity	Key Knowledge (By the end of the lesson)		Vocabulary (Tier 3)
			Substantive	Disciplinary	
Lesson 1	L.O.18: To be able to compare and group together everyday materials on the basis of their properties, including their transparency, conductivity (electrical and thermal), and response to magnets.	Compare a range of materials to test whether they are transparent, an electrical conductor, a thermal conductor, or magnetic. Predict and record the results in a table.	<ul style="list-style-type: none"> • Know that materials can be: hard/soft, soluble/insoluble, transparent/opaque, an electrical conductor, a thermal conductor and/or magnetic. 	Enquiry Skill Focus <u>Recording data</u> <ul style="list-style-type: none"> • Use tables to record the properties of different materials. 	Material Property Hardness Soluble/Insoluble Transparent/Opaque Electrical Conductor Thermal Conductor Magnetic

Lesson 2	L.O.18: To be able to compare and group together everyday materials on the basis of their properties, including their hardness.	Test a range of materials for their hardness by scratching, using different objects, such as a drinking straw, cocktail stick or iron nail. Consider the importance of this property in products produced at the steelworks.	<ul style="list-style-type: none"> Know that an important property of steel is its hardness. 		Material Property Hardness
Lesson 3	L.O.19: To be able to give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.	Recap on how different materials have different properties and that these properties enable them to be used for different purposes. Match materials to descriptions (including the materials' properties) and suggest how that material is suitable for a specific purpose, e.g. glass - window pane.	<ul style="list-style-type: none"> Know why objects are made from metals, plastics, wood, fabrics, glass and leather based on their properties. 		Material Property Hardness Soluble/Insoluble Transparent/Opaque Electrical Conductor Thermal Conductor Magnetic
Lesson 4	L.O.21: To know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.	Discuss materials which dissolve in water, such as sugar. Test and observe some of these materials. <u>Investigation</u> Investigate where the best place to locate a cup of salt water solution so that the water evaporates most quickly.	<ul style="list-style-type: none"> Know that sugar and salt will dissolve in water. Know that factors such as heat and airflow will affect the speed of dissolving. 	Enquiry Skill Focus <u>Observing and Measuring</u> <ul style="list-style-type: none"> Use measuring equipment to test the scientific question. 	Dissolve Soluble Insoluble Liquid Solid Solute Solvent Solution
Lesson 5	L.O.20: To be able to use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.	Discuss different methods of separating mixtures, e.g. decanting, sieving, filtering, use of magnets, evaporation.	<ul style="list-style-type: none"> Know that filtering, sieving, evaporating and magnetism are different processes that can separate mixtures of materials. 		Separate Mixture Solution Dissolve Evaporate Filter Sieve Magnet Particles

Lesson 6	L.O.20: To be able to use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.	Investigate the best way of separating different mixtures, including: sand and water; sand and iron filings, a salt water solution, etc.	<ul style="list-style-type: none"> Know when to use filtering, sieving, evaporating or magnetism to separate mixtures. 	Enquiry Approach Focus <u>Setting Up Tests</u> <ul style="list-style-type: none"> Decide on the method and equipment to use to carry out an enquiry - Separating mixtures. 	Separate Mixture Solution Dissolve Evaporate Filter Sieve Magnet Particles
Lesson 7	L.O.22: To be able to demonstrate that dissolving, mixing and changes of state are reversible changes.	Discuss what a reversible change is and recap on: <ul style="list-style-type: none"> Dissolving, e.g. a salt solution (<i>evaporation</i>). Mixing, e.g. sand and gravel (<i>sieving</i>). Change of State, e.g. water and ice (<i>melting and freezing</i>). 	<ul style="list-style-type: none"> Know that a reversible change is a change that can be undone or reversed. Know that some materials can be reversed through dissolving, mixing and change of state. 		Reversible Dissolve Mixture Change of State Evaporation Condensation Sieving Filtering Melting Freezing
Lesson 8	L.O.23: To be able to explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.	Discuss what an irreversible change is and demonstrate some examples, e.g. toasting a slice of bread; adding an acidic solution to bicarbonate of soda, etc. Consider the processes - heating, mixing, burning - involved.	<ul style="list-style-type: none"> Know that an irreversible change is a change that cannot be changed back again. Know that new materials are formed through an irreversible change. 		Irreversible Heating Mixing Burning Chemical Reaction
Lesson 9	L.O.22: To be able to demonstrate that dissolving, mixing and changes of state are reversible changes. L.O.23: To be able to explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.	Recap on reversible and irreversible changes. Look at a selection of descriptions of changing materials. Identify whether or not it is easily reversible and explain how. If it is not easily reversible, explain why.	<ul style="list-style-type: none"> Know that reversible and irreversible changes are different. 		Reversible Irreversible

Lesson 10	End of Unit Assessment				

At KS3 (year 7+) Children will learn:

- The particulate nature of matter
- The properties of the different states of matter (solid, liquid and gas) in terms of the particle model, including gas pressure
- Changes of state in terms of the particle model.
- Energetics
- Energy changes on changes of state (qualitative)
- Exothermic and endothermic chemical reactions (qualitative).
- The order of metals and carbon in the reactivity series
- The use of carbon in obtaining metals from metal oxides
- Properties of ceramics, polymers and composites (qualitative).
- Pure and impure substances
- The concept of a pure substance
- Mixtures, including dissolving
- Diffusion in terms of the particle model
- The identification of pure substances.
- Pure and impure substances
- Simple techniques for separating mixtures: filtration, evaporation, distillation and chromatography
- Atoms, Elements, Compounds
- A simple (Dalton) atomic Model
- Differences between atoms, elements and compounds
- Chemical symbols and formulae for elements and compounds
- Conservation of mass in changes of state and chemical reactions
- The Periodic Table: periods and groups; metals and non-metals.
- How patterns in reactions can be predicted with reference to the Periodic Table.
- The chemical properties of metal and non-metal oxides with respect to acidity.
- Chemical reactions as the rearrangement of atoms. -Representing chemical reactions using formulae and equations
- Combustion, thermal decomposition, oxidation and displacement 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
- What catalysts do
- Matter: Physical changes