Progression of knowledge science – Materials (Chemistry)

Threshold Concepts This concept involves becoming familiar with a range of materials, their properties, uses and how they may be altered or changed.	**EYFS**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
KS1 • Distinguish between an object and the material from which it is made. • Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock. • 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. • Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. • Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick/rock, and paper/cardboard for particular uses. **LKS2**	Use all their senses in hands on exploration of natural materials ● Explore collections of materials with similar and/or different properties ● Discuss the differences between materials and changes they notice ● Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. 1 (Everyday materials)	● Correctly identify and name an object and the material from which it is made. ● Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock. ● Describe the simple physical properties (see vocabulary appendix for examples) of a variety of everyday materials. ● Compare a variety of everyday materials on the basis of their simple physical properties. ● Group together a variety of everyday	• Identify what properties a material needs for a particular purpose. • Name the materials from which different objects are made. • Recognise suitable and unsuitable choices of materials for particular purposes based on physical properties (see vocabulary appendix for examples). • Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and	Group different kinds of rocks on the basis of appearance and simple physical properties, (see vocabulary appendix for examples). • Compare different kinds of rocks on the basis of appearance and simple physical properties, (see vocabulary appendix for examples). • Name the 3 types of rock. • Describe the features of each rock type. • Describe how each rock type is formed within the rock cycle.	Know that all things are made up of particles. • Know that particles are arranged differently in solids, liquids and gases. • Name properties of solids, liquids and gases. • Compare and group materials together according to if they are solids, liquids and gases, giving reasons to justify their choices. • Observe that some materials change state when heated or cooled, and are able to give everyday examples of	Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. ● Discuss the suitability of everyday materials for different purposes based on their properties, giving reasons, based on evidence from comparative and fair tests.

Progression of knowledge science – Materials (Chemistry)

Rocks and Soils • Compare and group together different kinds of rocks on the basis of their simple, physical properties. • Relate the simple physical properties of some rocks to their formation (igneous or sedimentary). • Describe in simple terms how fossils are formed when things that have lived are trapped within sedimentary rock. • Recognise that soils are made from rocks and organic matter. **States of Matter** • Compare and group materials together, according to whether they are solids, liquids or gases. • Observe that some materials change state when they are heated or cooled, and measure the temperature at which this happens in degrees Celsius (°C), building on their teaching in mathematics. • Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. UKS2 • Compare and group together everyday materials based on evidence from comparative and		materials on the basis of their simple physical properties. 2 (Uses of everyday materials	cardboard for particular uses. • Know that materials can be either man-made or naturally occurring. • Group objects into man-made or natural categories. • Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	• Name some different rocks and categorise them based on physical features. • Understand different uses for different rocks and how they change over time. • Explain simply how a fossil is formed. • Recognise that soils are made from rocks and organic matter, (living and dead) and be introduced to different soil types.	melting and freezing. • Understand that melting and freezing are a state change between solids and liquids. • Measure or research the temperature at which melting and freezing occurs for some materials. • Know that water freezes at 0oc and boils at 100oc. • Understand that condensation is a state change from a gas to a liquid. • Understand that evaporation is a state change from liquid to gas. • Understand that boiling and evaporation are the same state change from liquid to gas but at different temperatures. • Know that the speed of evaporation depends on a	● Know the difference between reversible and irreversible changes. ● Demonstrate that dissolving, mixing and changes of state are reversible changes. ● Explain that some changes results 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. ● Understand some materials will dissolve in liquid to form a solution.

Progression of knowledge science – Materials (Chemistry)

fair tests, including their hardness, solubility, conductivity (electrical and thermal), and response to magnets. • Understand how some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution. • Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. • Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. • Demonstrate that dissolving, mixing and changes of state are reversible changes. • 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, oxidisation and the action of acid on bicarbonate of soda.					number of variables including the temperature. • Describe the water cycle. • Identify the parts played by evaporation and condensation in the water cycle.	

Progression of skills to KS3 are detailed on materials / trust science sheets
Links from Reception Development Matters are detailed on the Reception Termly Planning Document