St Mark's CE Primary School
Science Curriculum Map: Materials

Year	National Curriculum	Sticky Knowledge	Vocab
R	***Year A Autumn*** • Making firework lava lamps – exploring how oil and water interact ***Year A Spring*** • Investigating how to stop a snowman from melting	***Year B Autumn*** • How do materials/ingredients change as they are heated? ***Year B Spring*** • Investigating magnetism	
1	***What can we discover about everyday materials? (Autumn 2)***		
	• 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	• A material is what an object is made from. • Everyday materials include wood, plastic, glass, metal, water, paper, brick, fabric and rock. • Objects can be looked at and compared based on their properties. • Materials have different properties. They can be hard or soft, dull or shiny, rough or smooth, opaque or transparent.	Wood Plastic Glass Metal Water Rock Material Object Property Hard/soft Shiny/dull Rough/smooth
1	***How can we sort everyday materials by their properties? (Spring 2)***		
	• 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.	• Objects and materials can be looked at, compared and grouped according to their properties. • Materials have different properties, such as hard or soft; stretchy or stiff; rough or smooth; shiny or dull; opaque or transparent; bendy or rigid; waterproof or not waterproof.	Hard/Soft Stretchy/Stiff Rough/Smooth Shiny/Dull Opaque/Transparent Bendy/Rigid Waterproof/Not Waterproof Compare Transparent Translucent Opaque
2	***Which materials are best for different jobs and why do they work so well? (Autumn 2)***		
	• Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.	• Materials are used for different things depending on their properties. • Some materials are more suitable than others to do a different job. For example, glass is better than wood for a window because glass is transparent and wood is opaque. • Some objects are made from more than one material. • Many materials are used for more than one purpose.	Metal Plastic Wood Brick Paper Fabric Sort Group Collect Data Sort Suitable Unsuitable Purpose Absorbent Absorbency Non-absorbent Shock absorbency Fragile
2	***How can we change the shapes of different materials? (Summer 1)***		
	• Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	• Some objects can be changed when you squash, stretch, twist or bend them • Changing the shapes of objects can make them more or less suitable for a	Bend Twist Squash Stretch Flexible

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		job.	Rigid Easy Hard Change Improve Suitable Purpose
4	***How do materials change when they heat up or cool down? (States of Matter)*** *(Spring)*		
	• 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 or research the temperature at which this happens in degrees Celsius • Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	• Materials can be grouped depending on whether they are solids, liquids or gases. • Solids stay in one place and can be held. Some solids can be squashed, bent, twisted and stretched. Examples of solids include wood, metal, plastic and clay. • Liquids move around (flow) easily and are difficult to hold. Liquids take the shape of the container in which they are held. Examples of liquids include water, juice and milk. • Gases spread out to fill the available space and cannot be held. Examples of gases include oxygen, helium and carbon dioxide. Air is a mixture of gases. • Heating or cooling materials can bring about a change of state. • The temperature at which materials change state varies depending on the material. • Water changes state from solid (ice) to liquid (water) at 0°C and from liquid (water) to gas (water vapour) at 100°C. • The process of changing from a solid to a liquid is called melting, The process of changing from a liquid to a solid is called freezing. • The process of changing from a liquid to a gas is called evaporation. The reverse process of changing from a gas to a liquid is called condensation. • The water cycle has four stages: evaporation, condensation, precipitation and collection. Water in lakes, rivers and streams is warmed by the sun, causing the water to evaporate and rise into the air as water vapour. As the water vapour cools, it condenses to form water droplets in clouds. The clouds become full of water until the water falls back to the ground as precipitation (rain, hail, snow and ice). The fallen water collects back in lakes, rivers and streams. • Evaporation and condensation are caused by temperature changes.	Solid Liquid Gas Compare Similar Different State Change Heated Melt Cool Freeze Melting point Freezing point Water cycle Evaporation Condensation Precipitation Transpiration

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5	***What makes materials useful and how can we change them?*** *(Autumn 1)*		
	• 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 • Know that 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 and the action of acid on bicarbonate of soda.	• Materials can be grouped according to their basic physical properties. Properties include hardness, solubility, transparency, conductivity (electrical and thermal) and magnetism. • Heat energy is transferred in three different ways: conduction, convection and radiation. A material that allows heat energy to travel through it is a thermal conductor. Poor thermal conductors are known as thermal insulators. • Some mixtures can be separated by filtering, sieving and evaporating. Sieving can be used to separate large solids from liquids and some solids from other solids. Filtering can be used to separate small solids from liquids. • Some materials (solutes) will dissolve in liquid (solvents) to form a solution. The solute can be recovered by evaporating off the solvent by heating. • A material's properties dictate what it can be used for. For example, cooking pans are made from metal, which is a good thermal conductor, allowing heat to quickly transfer from the hob to the contents of the pan. • Reversible changes include heating, cooling, melting, dissolving and evaporating. • Irreversible changes include burning, rusting, decaying and chemical reactions.	Physical properties Material Electrical conductor Magnetic Thermal insulator Thermal conductor Fair test Variable Dissolve Solution Soluble Solvent Solute Mixture Solution Separate Filtering Reversible Melting Evaporating Condensation Irreversible Chemical change Burning Rusting Permanent