

Year 5 – Materials (Changes)					
National Curriculum Objectives		Sticky Knowledge		Vocabulary	
<ul style="list-style-type: none"> 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. comparative and fair tests, for the particular uses of everyday materials, including wood, metals and plastic. Reverstrate that dissolving, mixing and changes of state are reversible changes. Explain that some changes result in the formation of new materials, and this kind of change is usually not reversible, including changes associated with burning and the action of acid on bicarbonate of soda 		<ul style="list-style-type: none"> All matter (including gas) has mass. Sometimes mixed substances react to make a new substance. These changes are usually irreversible. Heating can sometimes cause materials to change permanently. When this happens, a new substance is made. These changes are not reversible. Indicators that something new has been made are: The properties of the material are different (colour, state, texture, hardness, smell, temperature) If it is not possible to get the material back easily, it is likely that it is not there anymore and something new has been made (irreversible change) 		Hardness, Solubility, Transparency, Conductivity, Magnetic, Filter, Evaporation, Dissolving, Mixing, Material, conductor, dissolve, insoluble, suspension, chemical, physical, irreversible, solution, reversible, separate, mixture, insulator, transparent, flexible, permeable, soluble, property, magnetic, hard.	
Maths National Curriculum Objectives				Key Scientists	Linked Texts
<ul style="list-style-type: none"> solve comparison, sum and difference problems using information presented in a line graph complete, read and interpret information in tables, including timetables. 				Spencer Silver, Arthur Fry and Alan Amron (Post-It Notes) Ruth Benerito (Wrinkle-Free Cotton)	Itch (Simon Mayo) Kensuke's Kingdom (Michael Morpurgo) The BFG (Roald Dahl)
Working Scientifically Objectives		Key Question(s):		Prior Learning	
1.1 planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary 1.2 taking measurements, using a range of scientific equipment, with increasing accuracy and precision 1.3 recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graphs 1.4 using test results to make predictions to set up further comparative and fair tests 1.5 reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of results, in oral and written forms such as displays and other presentations 1.6 identifying scientific evidence that has been used to support or refute ideas or arguments.		<ul style="list-style-type: none"> The key question we want children to interrogate is: "have we made a new substance?" - Wet clay → air-dried clay → fired clay. - Flour and water → dough → bread. Add sugar to fizzy water; it fizzes up. Has a new substance been made? (No, the gas was dissolved in the water and adding sugar made it become undissolved) Add baking powder to vinegar; it fizzes up. Has a new substance been made? (Yes the gas was not in the vinegar as it wasn't fizzy, so it must have been made) Add water to instant snow. Use lemon juice as an invisible ink, heating gently makes the ink visible. Is this a new substance? When water is added to jelly and it is set, is it a new substance. When materials are heated or mixed with other materials they sometimes can be made to turn into new materials. The question is how would we know if it was a new material or the same material mixed differently? 		In Year 4 children should: <ul style="list-style-type: none"> Compare and group materials together, according to whether they are solids, liquids or gases. Observe that some materials change state when heated or cooled, and measure and 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. 	
				Future Learning	
				In KS3 children will learn about: <ul style="list-style-type: none"> the concept of a pure substance mixtures, including dissolving diffusion in terms of the particle model simple techniques for separating mixtures: filtration, evaporation, distillation and chromatography the identification of pure substances 	
Teaching Ideas					
Comparative tests	Identify & Classify	Observation over time	Pattern Seeking	Research	BIG Question – Assessment Opportunity
Which material rusts fastest/slowest? How can we change the 'jellyness' of jelly?	Can you identify and classify these reactions and changes into reversible, and irreversible? Can you describe their groups similarities and differences?	How does a nail in salt water change over time?	What patterns can you notice in different reactions? How does the amount of bicarbonate of soda, washing up liquid and vinegar affect the reaction?	What are smart materials and how can they help us?	How can we change materials reversibly and irreversibly?