

Properties of Materials : YEAR 5 SCIENCE MEDIUM TERM PLAN

<p>Year 3 NC statutory objectives:</p> <ul style="list-style-type: none"> - observe how magnets attract or repel each other and attract some materials and not others - compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, <p>Year 4 NC statutory objectives:</p> <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 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 	<p>Year 5 NC statutory objectives:</p> <ul style="list-style-type: none"> • Classify materials into the 3 states of matter and sort them based on their properties • Understand magnets, filtering, sieving & evaporating to separate a range of mixtures and decide on the best method for separating different mixtures • Know and explain different properties e.g. absorbency or conductivity • Understand what dissolving is and how it can be sped up • Explain the difference between a reversible and irreversible change.
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At the end of this science unit of work pupils will

Know: Understand why 3 states of matter behave differently/Explain different properties such as hardness/ absorbency/ magnetism/ conductor – classify materials according to these/ know the difference between irreversible and reversible changes/ explain what affects dissolving

Can do: Sort materials on their properties. measure and observe Record data using scientific diagrams and line graphs, Report findings from enquiries

Understand the vocabulary listed below – able to explain and discuss it without reading it from their science workbook

Disciplinary knowledge: Classifying materials, identifying solids, liquids and gases, tables of properties, pupils are taught to draw with ruler, pencil and measuring their own table in their book, drawing simple conclusions

Substantive: Knowledge and vocabulary of dissolving and properties of materials.

The expectation is that ALL pupils can learn, explain and write coherently about the aspects below.

Reading of books at home and in school on materials, teaching of how to use the glossary and contents.

Misconceptions to be corrected

- The incorrect use of the terms melting/freezing/evaporation and condensation
- That all solids dissolve
- That all metals are magnetic
- The physics that they learn is not relevant to their everyday lives

Pupils will learn	Vocabulary pupils will learn	Writing using a genre/tables	Links to what children learnt prior:	Fundamental principles and teaching techniques to ensure
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				that work is of a high standard from all pupils
<p><u>Properties - 3 states of matter</u></p> <p>Revise features of states of matter: solid, liquid & gas. Rehearse properties of materials discussed in earlier years, e.g. electrical</p>	<p>To revise:</p> <p>Solid Liquid Gas Poured Flows Volume Fixed Shape Force Particles Formation</p>	<p>. Table – with all statements about each state explaining whether they flow – particle diagrams</p>	<p>- Comparing and grouping materials year 4 – understanding which metals attract and repel Y3 magnets</p>	<ul style="list-style-type: none"> • Clear expectations for listening – repeating and learning the information. Clear bite-size instruction and explanation from the teacher using parts of video’s where appropriate. • Behave from all pupils is exemplary and comments are made on sitting and listening. • Bite sized chunks of knowledge making time for repetition discussion and rehearsing in pairs. • Emphasis on learning and exploring key vocabulary. Repetition in oral WORK AND INSISTENCE THAT THE CORRECT TERMS ARE USED IN WRITING. • Drafting process for tables and writing • Writing of date and modelling of key letters e.g. in January. • Demonstration and insistence on high standards of construction and presentation
<p><u>Properties - Absorbency</u></p> <p>Revise features of states of matter: solid, liquid & gas. Rehearse properties of materials discussed in earlier years, e.g. electrical</p>	<p>Absorbent Absorbency Air pockets Saturated Submerged Mass Volume</p>	<p>Pupils carry out investigation with different strips of material e.g. jey cloth/ paper towel etc</p> <p>Measure accurately the absorbency and write a fair test/ explanation.</p>	<p>Y4 classifying solids/ liquids/ gases</p>	

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				<ul style="list-style-type: none"> Finger under words to copy words – insist accurate.
<p><u>Properties - Moh's Hardness Scale</u></p> <p>Set of rocks, common items for hardness testing, e.g. chalk, copper wire, brass split pin, penny, iron nail, steel nail file, ceramic tile, etc., tray, safety goggles.</p>	<p>Hardness Scratch Classify Compare Rocks Gypsum Limestone Steel file Penny Brass pin Slate Gabbro</p>	<p>Pupils scratch the different objects in groups – they write an explanation of their findings.</p> <p>They draw the scale and label on the different materials tried.</p>		<ul style="list-style-type: none"> The vocabulary is broken down into the weekly learning, it is revised and used in writing Pupils write their own vocabulary into their books putting their finger under the words to copy correctly. <p>End products – handwriting and colouring is beautifully presented.</p>
<p><u>Properties – Conductor/Thermal Insulator</u></p> <p>Vacuum flask of tea prepared earlier. Vegetable fat, bowl of ice-cold water. Beakers, hot water, thermometers, materials to use as insulators, e.g. bubble wrap, newspaper, aluminium foil, fabrics, cotton wool, old woollen jumper cut into sections, flexible polystyrene sheets, cling film, range of fabrics, etc. Thermometers. Block of ice-cream cut into slices, petri dishes. Access to internet</p>	<p>Insulate Maintain temperature Regulate Material Layers</p>	<p>Link to reading about David Walliams swimming the channel- how did he keep warm?</p>		

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<p><u>Properties – Separating Mixtures</u></p> <p>Pupils choose from a range of equipment to separate different mixtures e.g. sand, salt, water and stones.</p>	<p>Sieving Filtering / filtration Magnet Dissolving Evaporation/ boiling Decanting</p>	<p>Pupils respond scientifically to the characters from a discussion diagram explaining why they agree or disagree with their opinions.</p>		
<p>Properties – solubility</p> <p>Which formed sediment? Solution? Chemical Reaction? – these cannot be separated</p> <p>Sand, flour, baking powder, coffee, salt, oil, sugar, wallpaper paste (fungicide-free), powder paint, plaster of Paris, Andrew’s salts or Alka Seltzer™ tablets, cement. Margarine tub or equivalent, beakers, glass rods or old spoons for stirring, goggles, stop watches, thermometers. Access to internet</p> <p>How does the temperature/ number of stirs affect solubility?</p> <p><u>AT1 – How Does Stirring Affect The Rate At Which A Sweetener Dissolves?</u></p>	<p>Solute Solvent Soluble/ insoluble Solution Dissolved Saturated</p>	<p>. Pupils draw a table to explain which solutes dissolved and which formed sediment – does this match their predictions?</p> <p>What have they learnt about solubility? Explain.</p> <p>Investigate and write as a full investigation – draft a letter to Canderel the sweetener manufacturer to explain/ resent their findings.</p>		
<p><u>Properties – Reversible or Irreversible changes ?</u></p> <p>BAKING SODA/ VINEGAR</p> <p>Set up rusting investigation ?</p>	<p>Reversible Irreversible Gas produced Biproduct Chemical reaction</p>	<p>A table can be used to record their observations. Children will need to record their observations taken throughout this first day, but may also want to continue recording over the next few days.</p>		

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<p>In groups children set up a rusting nail enquiry. They should predict what they think will happen, ensure that they are making a fair test and write an explanation of the way they have set up the enquiry.</p>		<p>Iron nails, paint, varnish, oil, petroleum jelly, beakers, sponge pieces, water. Optional: ice, dough, cake mixture, chocolate, water, sand, raw egg, unfired clay. Matches, safety goggles, tongs, paper, twigs, tiny pieces of fabric, furniture</p>		
<p><u>Properties – Reversible or Irreversible changes – Rusting</u></p> <p>Children look at different scenarios e.g frying an egg, baking a cake</p>	<p>Rust Chemical reaction Formed New material Liquid</p>	<p>They draw diagrams and write explanations of which are chemical reactions (irreversible) and how they know this,</p>	<p>Y4 identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature</p>	