



Lowerhouse Junior School Key Learning in Science – Material Properties



Key Learning: Material Properties

Key Learning	Notes and guidance (Non-statutory)	Working Scientifically (Featured skills)
<p>LKS2: Year 2 – Uses of Everyday Materials</p> <ul style="list-style-type: none">▪ 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.▫ Some materials can be found naturally; others have to be made.	<p>LKS2: Year 2 – Uses of Everyday Materials</p> <p><i>Pupils should identify and discuss the uses of different everyday materials so that they become familiar with how some materials are used for more than one thing (metal can be used for coins, cans, cars and table legs; wood can be used for matches, floors, and telegraph poles) or different materials are used for the same thing (spoons can be made from plastic, wood, metal, but not normally from glass). They should think about the properties of materials that make them suitable or unsuitable for particular purposes and they should be encouraged to think about unusual and creative uses for everyday materials. Pupils might find out about people who have developed useful new materials; for example, John Dunlop, Charles Macintosh or John McAdam.</i></p>	<p>LKS2: Year 2 – Uses of Everyday Materials</p> <ul style="list-style-type: none">• <i>Comparing the uses of everyday materials in and around the school with materials found in other places (at home, the journey to school, on visits, and in stories, rhymes and songs).</i>• <i>Observing closely.</i>• <i>Identifying and classifying the uses of different materials, and</i>• <i>Recording their observations.</i>• <i>Thinking about unusual and creative uses for everyday materials.</i>
<p>LKS2: Year 3 – Rocks</p> <ul style="list-style-type: none">▪ Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.▪ Describe in simple terms how fossils are formed when things that have lived are trapped within rock.▪ Recognise that soils are made from rocks and organic matter.	<p>LKS2: Year 3 – Rocks</p> <p><i>Linked with work in geography, pupils should explore different kinds of rocks and soils, including those in the local environment.</i></p>	<p>LKS2: Year 3 – Rocks</p> <ul style="list-style-type: none">• <i>Observing rocks, including those used in buildings and gravestones, and exploring how and why they might have changed over time.</i>• <i>Using a hand lens or microscope to help them identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them.</i>

<ul style="list-style-type: none"> ▫ Rocks and soils can feel and look different. ▫ Rocks and soils can be different in different places/environments. <p>[Please note – rocks and soils could be taught within an environment unit <i>or</i> a material properties unit. For convenience we have included it in the material properties unit and referenced it again in the environment unit for schools to make their own choice of when to teach it].</p>		<ul style="list-style-type: none"> • <i>Research and discuss the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed</i> • <i>Explore different soils and identify similarities and differences between them and investigate what happens when rocks are rubbed together [hardness test] or what changes occur when they are in water [permeability test].</i> • <i>Raise and answer questions about the way soils are formed.</i>
<p>LKS2: Year 4 – States of Matter – see also the Inspiring Science Unit on ‘Material Changes’</p> <ul style="list-style-type: none"> ▪ Compare and group materials together, according to whether they are solids, liquids or gases. ▫ Solids, liquids and gases can be identified by their observable properties. ▫ Solids have a fixed size and shape (the size and shape can be changed but it remains the same after the action). ▫ Liquids can pour and take the shape of the container in which they are put. ▫ Liquids form a pool not a pile. ▫ Solids in the form of powders can pour as if they were liquids but make a pile not a pool. ▫ Gases fill the container in which they are put. ▫ Gases escape from an unsealed container. ▫ Gases can be made smaller by squeezing/pressure. ▫ Liquids and gases can flow. 	<p>LKS2: Year 4 – States of Matter – see also the Inspiring Science Unit on ‘Material Changes’</p> <p><i>Pupils should explore a variety of everyday materials and develop simple descriptions of the states of matter (solids hold their shape; liquids form a pool not a pile; gases escape from an unsealed container). Pupils should observe water as a solid, a liquid and a gas</i></p>	<p>LKS2: Year 4 – States of Matter – see also the Inspiring Science Unit on ‘Material Changes’</p> <ul style="list-style-type: none"> • <i>Grouping and classifying a variety of different materials.</i>
<p>UKS2: Year 5 –Properties and Changes of Materials</p> <ul style="list-style-type: none"> ▪ Compare and group together everyday materials on the basis of their properties, including their 	<p>UKS2: Year 5 –Properties and Changes of Materials</p>	<p>UKS2: Year 5 –Properties and Changes of Materials</p> <ul style="list-style-type: none"> • Carry out tests to answer questions such as ‘Which materials would be the most effective for

<p>hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets</p> <ul style="list-style-type: none"> ▪ Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic ▫ Compare a variety of materials and measure their effectiveness (e.g. hardness, strength, flexibility, solubility, transparency, thermal conductivity, electrical conductivity) <p>Temperature and Thermal Insulation</p> <ul style="list-style-type: none"> ▫ Heat always moves from hot to cold. ▫ Some materials (insulators) are better at slowing down the movement of heat than others. <p>Objects/liquids will warm up or cool down until they reach the temperature of their surroundings.</p>	<p>Pupils should build a more systematic understanding of materials by exploring and comparing the properties of a broad range of materials and relating these to what they learnt about magnetism in Year 3 and about electricity in Year 4.</p> <p>Note: Pupils are not required to make quantitative measurements about conductivity and insulation at this stage. It is sufficient for them to observe that some conductors will produce a brighter bulb in a circuit than others and that some materials will feel hotter than others when a heat source is placed against them.</p>	<p>making a warm jacket, for wrapping ice cream to stop it melting, or for making blackout curtains?’</p> <ul style="list-style-type: none"> • Compare materials in order to make a switch in a circuit.
<p>Key Learning (Key Stage 1)</p>	<p>Notes and guidance (Key Stage 1) (Non-statutory)</p>	<p>Working Scientifically (Key Stage 1) (Featured skills)</p>
<p>Pupils should be taught to:</p> <p>KS1: Year 1 - Everyday Materials</p> <ul style="list-style-type: none"> ▪ 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. <p>Compare and group together a variety of everyday materials on the basis of their simple physical properties.</p>	<p>KS1: Year 1 - Everyday Materials</p> <p><i>Pupils should explore, name, discuss and raise and answer questions about everyday materials so that they become familiar with the names of materials and properties such as: hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/not waterproof; absorbent/not absorbent; opaque and transparent. Pupils should explore and experiment with a wide variety of materials, not only those listed in the programme of study, but including for example: brick, paper, fabrics, elastic, foil.</i></p>	<p>Pupils might work scientifically by:</p> <p>KS1: (Year 1 - Everyday Materials)</p> <ul style="list-style-type: none"> • <i>Performing simple tests to explore questions, for example: ‘What is the best material for an umbrella? ...for lining a dog basket? ...for curtains? ...for a bookshelf? ...for a gymnast’s leotard?’</i>