

# Science

Big Idea: Materials						
ASPECT: Identification and classification						
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
National Curriculum	<p><u>Working scientifically</u> Identify and classify.</p> <p><u>Everyday materials</u> Distinguish between an object and the material from which it is made.</p> <p>Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.</p> <p>Describe the simple physical properties of a variety of everyday materials.</p> <p>Compare and group together a variety of everyday materials on the basis of their simple physical properties.</p>	<p>Develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them.</p> <p><u>Working scientifically</u> Perform simple tests.</p> <p>Identify and classify.</p> <p>Observe closely, using simple equipment.</p> <p>Use their observations and ideas to suggest answers to questions.</p> <p><u>Uses of everyday materials</u> Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p>	<p><u>Working scientifically</u> Set up simple practical enquiries, comparative and fair tests.</p> <p>Gather, record, classify and present data in a variety of ways to help in answering questions.</p> <p><u>Light</u> Notice that light is reflected from surfaces.</p>	<p><u>Working scientifically</u> Set up simple practical enquiries, comparative and fair tests.</p> <p>Gather, record, classify and present data in a variety of ways to help in answering questions.</p> <p><u>States of matter</u> Compare and group materials together, according to whether they are solids, liquids or gases.</p>	<p><u>Working scientifically</u> Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</p> <p>Report and present findings from enquiries, including conclusions, casual relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.</p> <p><u>Properties and changes of materials</u> Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.</p> <p>Demonstrate that dissolving, mixing and changes of state are reversible changes.</p> <p>Compare and group everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal) and response to magnets.</p>	<p><u>Working scientifically</u> Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</p> <p>Using test results to make predictions to set up further comparative and fair tests.</p> <p>Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</p> <p>Report and present findings from enquiries, including conclusions, casual relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.</p> <p><u>Evolution and inheritance</u> Identify how animals are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p>

# Science

Skills	Identify and name what an object is made from, including wood, plastic, glass, metal, water and rock.	Observe what happens when a range of everyday materials, including foods, are heated and cooled, sorting and grouping them based on their observations.	Group and sort materials as being reflective or non-reflective.	Group and sort materials into solids, liquids or gases.	Compare and group everyday materials by their properties, including hardness, solubility, transparency, conductivity (electrical and thermal) and magnetism. Explain, following observation, that some substances (solutes) will dissolve in liquid (solvents) to form a solution and the solute can be recovered by evaporating off the solvent.	Investigate and identify good thermal insulators, describing their common features.
Knowledge	A material is what an object is made from. Everyday materials include wood, plastic, glass, metal, water, rock, brick, paper and fabric.	Some foods, such as ice and chocolate, melt when heated, but then harden (solidify or freeze) when cooled.	Light can be reflected from different surfaces. Some surfaces are poor reflectors, such as some fabrics, while other surfaces are good reflectors, such as mirrors.	Materials can be grouped according to 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. Air is a mixture of gases.	Materials can be grouped according to their basic physical properties. Properties include hardness, solubility, transparency, conductivity (electrical and thermal) and magnetism. Some materials (solutes) will dissolve in liquid (solvents) to form a solution. The solute can be recovered by evaporating off the solvent by heating.	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. Insulation is important for the survival of many animals. Blubber is a layer of fat that acts as an insulator under the skin of some animals, such as walruses and whales. It is an adaptation that is essential for their survival. Animals with fur, such as polar bears and Arctic foxes, trap a layer of air close to their skin to insulate them from the cold.
Topic / Coverage	Moon Zoom!	Muck, Mess & Mixtures	Stand alone science lessons about 'Light'	Blue Abyss	Weekly science – materials	Weekly Science – Adaptation Frozen Kingdom

# Science

ASPECT: Properties and uses						
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
National Curriculum	<p><b>Working scientifically:</b> Perform simple tests.</p> <p><b>Identify and classify.</b></p> <p><u>Everyday materials</u> Describe the simple physical properties of a variety of everyday materials.</p> <p>Distinguish between an object and the material from which it is made.</p> <p>Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.</p> <p><b>Compare and group together a variety of everyday materials on the basis of their simple physical properties.</b></p>	<p>Develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them.</p> <p><u>Working scientifically</u> Use their observations and ideas to suggest answers to questions.</p> <p><b>Identify and classify.</b></p> <p><u>Uses of everyday materials</u> Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</p>	<p><b>Working scientifically:</b> Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</p> <p>Identify differences, similarities or changes related to simple scientific ideas and processes.</p> <p><b>Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</b></p> <p><b>Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.</b></p> <p><b>Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</b></p> <p><u>Rocks</u> Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.</p> <p><u>Forces and magnets</u> Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials.</p>	<p><b>Working scientifically:</b> Set up simple practical enquiries, comparative and fair tests.</p> <p><b>Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.</b></p> <p><b>Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</b></p> <p><u>Electricity</u> Recognise some common conductors and insulators, and associate metals with being good conductors.</p> <p>Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.</p>	<p><b>Working scientifically:</b> Use test results to make predictions to set up further comparative and fair tests.</p> <p><b>Report and present findings from enquiries, including conclusions, casual relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.</b></p> <p><u>Properties and changes of materials</u> Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.</p> <p>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.</p>	<p><b>Working scientifically:</b> Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.</p> <p><u>Light</u> Recognise that light appears to travel in straight lines.</p> <p>Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye.</p> <p>Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes .</p>

# Science

Skills	Investigate and describe the simple physical properties of some everyday materials, such as hard or soft; stretchy or stiff; rough or smooth; opaque or transparent; bendy or rigid; waterproof or not waterproof and magnetic or non-magnetic.	Compare the suitability of a range of everyday materials for particular uses, including wood, metal, plastic, glass, brick, rock, paper and cardboard	Compare and group rocks based on their appearance, properties or uses. Compare and group materials based on their magnetic properties.	Describe materials as electrical conductors or insulators.	Separate mixtures by filtering, sieving and evaporating. Describe, using evidence from comparative or fair tests, why a material has been chosen for a specific use, including metals, wood and glass.	Describe, using diagrams, how light behaves when reflected off a mirror (plane, convex or concave) and when passing through a lens (concave or convex).
Knowledge	Materials have different properties, such as hard or soft; stretchy or stiff; rough or smooth; opaque or transparent; bendy or rigid; waterproof or not waterproof; magnetic or non-magnetic.	A material's physical properties make it suitable for particular purposes, such as glass for windows and brick for building walls. Many materials are used for more than one purpose, such as metal for cutlery and cars.	There are three different rock types: sedimentary, igneous and metamorphic. Sedimentary rocks form from mud, sand and particles that have been squashed together over a long time to form rock. Examples include sandstone and limestone. Igneous rocks are made from cooled magma or lava. They usually contain visible crystals. Examples include pumice and granite. Metamorphic rocks are formed when existing rocks are heated by the magma under the Earth's crust or squashed by the movement of the Earth's tectonic plates. They are usually very hard. Examples include slate and marble. Some materials have magnetic properties. Magnetic materials are attracted to magnets. All magnetic materials are metals but not all metals are magnetic. Iron is a magnetic metal.	Electrical conductors allow electricity to flow through them, whereas insulators do not. Common electrical conductors are metals. Common insulators include wood, glass, plastic and rubber.	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. Evaporating can be used to separate dissolved solids from liquids. 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.	Mirrors and lenses are used in a range of everyday objects (telescopes, periscopes, cards and on roads). The human eye has a lens that bends and focuses light on the back of the eye (retina) so that we can see.
Topic / Coverage	Moon Zoom!	Land Ahoy! Muck, Mess & Mixtures	Tremors	Blue Abyss (stand alone lesson leading up to making lighthouses)	Covered in weekly science – materials	Weekly science- light