



# SCIENCE CYCLE A

To be taught 1.5 hours (KS1) and 2 hours (KS2) weekly

AUTUMN

SPRING

SUMMER

EYFS

**Working scientifically:** to feel confident to answer simple questions about observable properties of objects and people, animals and plants around them; to compare objects in their environment and talk about similarities and differences; to ask questions about the world around them and seek to find their own answers.

**Plants:** to know what a plant is; to know what a flower is; to know where you see plants; to describe different plants and flowers.

**Animals including humans:** to know what an animal is; to recognise and name a variety of different animals; to know the names of different body parts of humans and animals they have experience of.

**Everyday materials:** to recognise that different everyday objects are made from different materials; to describe how different objects look and feel.

**Seasonal change:** to know about different types of weather; to observe changes in trees and plants as the seasons progress.

- Can you describe the change in living things?
- Can you describe the changes you see in Autumn?
- Can you name the seasons?

- Can you comment on observations you have made in the change in living things? (changes in the leaves, weather and seasons)
- Can you explain what nocturnal animals are and give examples? Can you explain different environments and habitats?
- Can you observe and comment on the change in living things? (changes in the leaves, weather and seasons)
- Can you explore the world around you and see how it changes as we enter Summer?
- Do you have curiosity to touch, smell and hear the natural world around you through hands-on experiences?

- Can you observe life cycles (chicks and plants) through observations, first hand experiences and non-fiction texts?
- Can you list the changes you have made yourself and your developmental changes (height, motor skills etc)?
- Can you comment on the change in living things (changes in the leaves, weather and seasons)?
- Can you make healthy food choices and do you understand where your food comes from?
- Do you understand how different materials can be waterproof, float, magnetic (floating, sinking, boat building, metallic, non-metallic objects)?

With the exception of EYFS, Science is to be taught on a two-year rolling cycle. The year objectives have been covered for both year groups (1&2; 3&4; 5&6) over the course of two years. The bracketed year group merely indicates which objectives to teach for that topic and are for reference only. Teachers are to ensure that they stick to the objectives as laid out below to avoid any overlap in the following year. Teachers are to consider cross curricular links with Geography, History, DT and to think about the English curriculum in their planning. Children will have the opportunity to witness the life cycle of chicks throughout the school years, focusing on different aspects and scientific/mathematical skills as age and curriculum appropriate.

YEAR 1/2	USES OF EVERYDAY MATERIALS (Y1) <b>CHEMISTRY</b>	USES OF EVERYDAY MATERIALS (Y2) <b>CHEMISTRY</b>	LIVING THINGS AND THEIR HABITATS (Y2) <b>BIOLOGY</b>
	<p>BIG QUESTION: What materials are objects made of?</p> <p>PRIOR LEARNING: EYFS the concept of floating and sinking linked to boat building; metallic and non-metallic objects</p> <p>NEXT STEPS: Uses of everyday materials Y2</p>	<p>BIG QUESTION: How do we choose materials? Can we physically change materials?</p> <p>PRIOR LEARNING: EYFS the concept of floating and sinking linked to boat building; metallic and non-metallic objects; Uses of everyday materials Y1</p> <p>NEXT STEPS: Rocks Y3; Forces and magnets Y3; Properties and changes of materials Y5</p>	<p>BIG QUESTION: What do living things need in order to survive?</p> <p>PRIOR LEARNING: EYFS to understand where dinosaurs are now and begin to understand that they were alive a very long time ago; learn about what a palaeontologist is; Plants Y1; Animals including humans Y1; Seasonal change Y1</p> <p>NEXT STEPS: Living things and their habitats Y4; Animals including humans Y4</p>
	<p><b>Notes:</b> 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.</p>		<p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>• Pupils should be introduced to the idea that all living things have certain characteristics that are essential for keeping them alive and healthy.</li> <li>• They should raise and answer questions that help them to become familiar with the life processes that are common to all living things.</li> <li>• Pupils should be introduced to the terms 'habitat' (a natural environment or home of a variety of plants and animals) and 'microhabitat' (a very small habitat, for</li> </ul>

			<p>example for woodlice under stones, logs or leaf litter).</p> <ul style="list-style-type: none"> <li>• They should raise and answer questions about the local environment that help them to identify and study a variety of plants and animals within their habitat and observe how living things depend on each other, for example, plants serving as a source of food and shelter for animals.</li> <li>• Pupils should compare animals in familiar habitats with animals found in less familiar habitats, for example, on the seashore, in woodland, in the ocean, in the rainforest.</li> </ul>
	<p>Pupils might work scientifically by:</p> <ul style="list-style-type: none"> <li>• explore, name, discuss and raise and answer questions about everyday materials</li> <li>• 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?'</li> </ul>	<p>Pupils might work scientifically by:</p> <ul style="list-style-type: none"> <li>• 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)</li> <li>• observing closely, identifying and classifying the uses of different materials, and recording their observations</li> </ul>	<p>Pupils might work scientifically by:</p> <ul style="list-style-type: none"> <li>• Children could sort and classify things according to whether they are living, dead or were never alive, and recording their findings using charts.</li> <li>• They should describe how they decided where to place things, exploring questions like: 'Is a flame alive? Is a deciduous tree dead in winter?' and talk about ways of answering their questions.</li> <li>• They could construct a simple food chain that includes humans (eg, grass, cow, human).</li> <li>• They could describe the conditions in different habitats and microhabitats (under log, on stony path, under bushes); and find out how the conditions affect the number and type(s) of plants and animals that live there</li> </ul>

	<p><b>VOCABULARY:</b> material, wood, plastic, glass, metal, water, rock, properties, hard, soft, stretchy, stiff, shiny, dull, rough, smooth, bendy, waterproof, absorbent, opaque, transparent, compare, group, identify</p>	<p><b>VOCABULARY:</b> identify, compare, suitability, wood, metal, plastic, glass, brick, rock, paper, cardboard, different, use, materials, properties, suitable, unsuitable, purpose, unusual, every day, solid, object, shape, squashing, bending, twisting, stretching</p>	<p><b>VOCABULARY:</b> living, dead, never been alive, suited, suitable, basic needs, food, shelter, move, feed, food chain Names of local habitats – woodland, pond etc Names of micro-habitats – under logs, in bushes etc</p>
	<p><b>POSSIBLE SCIENTISTS TO RESEARCH:</b> <a href="#">Becky Schroeder</a> (inventor of glo sheets) <a href="#">Chester Greenwood</a> (inventor of ear muffs)</p>	<p><b>POSSIBLE SCIENTISTS TO RESEARCH:</b> <a href="#">Charles Mackintosh</a> (inventor of raincoat) <a href="#">John McAdam</a> (inventor of modern road surfaces)</p>	<p><b>POSSIBLE SCIENTISTS TO RESEARCH:</b> <a href="#">Prem Gill</a> (polar scientist) – he works at the British Antarctic Survey in Cambridge and works alongside Mrs Birchenall’s daughter who came to this school too! <a href="#">Dawood Qureshi</a> (marine biologist)</p>
	<p><b>ENQUIRY QUESTIONS:</b></p> <ol style="list-style-type: none"> <li>1. <a href="#">Is there a difference between an object and the material it is made from?</a> (NC Objective: Distinguish between an object and the material from which it is made.)</li> <li>2. <a href="#">Which everyday materials can I identify?</a> (NC Objective: Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock.)</li> <li>3. <a href="#">Can I describe the properties of everyday materials?</a> (NC Objective: Describe the simple physical properties of a variety of everyday materials such as: hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/not waterproof; absorbent/not absorbent; opaque/transparent.)</li> <li>4. <a href="#">How can I investigate whether an object floats or sinks?</a> (NC Objective: Describe the simple physical properties of a variety of</li> </ol>	<p><b>ENQUIRY QUESTIONS:</b></p> <ol style="list-style-type: none"> <li>1. <a href="#">Everyday materials have different properties which mean they are suitable for different purposes. Can I identify and compare them?</a> (NC Objective: Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses)</li> <li>2. <a href="#">Can I investigate and compare the properties of different metals?</a> (NC Objective: Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses)</li> <li>3. <a href="#">Can I explain why a spoon can be made out of different materials and why materials can be used for lots of everyday objects?</a> (NC Objective: identify and discuss the uses of different everyday materials so that they become familiar with how some materials are</li> </ol>	<p><b>ENQUIRY QUESTIONS:</b></p> <ol style="list-style-type: none"> <li>1. <a href="#">What is different between things that are living, dead and things that have never been alive?</a> (NC Objective: explore and compare the differences between things that are living, dead, and things that have never been alive)</li> <li>2. <a href="#">Which characteristics do living things need in order to keep them alive and healthy?</a> (NC Objective: identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other)</li> <li>3. <a href="#">How do animals obtain their food from plants and other animals?</a> (NC Objective: Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food)</li> </ol>

	<p><i>everyday materials such as: hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/not waterproof; absorbent/not absorbent; opaque/transparent.)</i></p> <p>5. <b>Can I compare and group everyday materials using their properties?</b> <i>(NC Objective: Compare and group together a variety of everyday materials on the basis of their simple properties.)</i></p> <p>6. <b>Can I investigate and choose a good material for a purpose?</b> <i>(NC Objective: Compare and group together a variety of everyday materials on the basis of their simple properties.)</i></p>	<p><i>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)</i></p> <p>4. <b>What unusual and creative uses for everyday materials can I think of? What reasons can I think of to explain why their properties will make them suitable or unsuitable for a particular purpose – for instance, how useful would a chocolate door handle be? Can I suggest suitable materials for new situations?</b> <i>(NC Objective: think about the properties of materials that make them suitable or unsuitable for particular purposes and be encouraged to think about unusual and creative uses for everyday materials)</i></p> <p>5. <b>Can the shape of solid objects be changed by squashing, bending, twisting and stretching?</b> <i>(NC Objective: find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching)</i></p> <p>6. <b>Which people have created new materials that are useful? Can I explain how inventors have made new materials?</b> <i>(NC Objective: find out about people who have developed useful new materials, for example John Dunlop, Charles Macintosh or John McAdam)</i></p>	<p>4. <b>What is a food chain?</b> <i>(NC Objective: Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food)</i></p> <p>5. <b>What is a habitat? What is a microhabitat? Can I map a habitat and identify what is in it?</b> <i>(NC Objective: To identify and name a variety of plants and animals in their habitats, including microhabitats)</i></p> <p>6. <b>How do different habitats provide the needs of different kinds of animals and plants?</b> <i>(NC Objective: To identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants)</i></p> <p>7. <b>Can you compare animals in familiar habitats with animals found in less familiar habitats?</b> <i>(NC Objective: To identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants)</i></p>
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	<b>SEASONAL CHANGES (Y1)</b> <b>BIOLOGY</b> BIG QUESTION: Do living things change or stay the same during the four different seasons?		
	PRIOR LEARNING: EYFS NEXT STEPS: Light (Y3); Earth and Space (Y5); Physics KS3		
	<b>Note:</b> pupils should be warned that it is not safe to look directly at the sun, even when wearing dark glasses		
	Pupils might work scientifically by: <ul style="list-style-type: none"> <li>making tables charts about the weather</li> <li>making displays of what happens in the world around them, including day length, as the seasons change</li> </ul>		
	VOCABULARY: Changes, observe, seasons, Autumn, Winter, Spring, Summer, describe, longer, daylight, sunny, sunshine, clouds, rain, wind, cool, fresh, warm, hot, temperature		
	POSSIBLE SCIENTISTS TO RESEARCH: <a href="#">Jim Cantore</a> - meteorologist		
	ENQUIRY QUESTIONS: 1. Can I create a pictogram of the number of hours of daylight in different seasons? <i>(NC Objective: observe changes across the seasons; observe and describe weather associated with the seasons and how day length varies)</i> 2. Can I place the months and seasons in order? <i>(NC Objective: observe changes across the four seasons)</i> 3. Can I match some events to their seasons? <i>(NC Objective: observe changes across the four seasons)</i>	ENQUIRY QUESTIONS: 1. Can I explain why we need to wear different clothes in different seasons? <i>(NC Objective: observe changes across the four seasons)</i> 2. Can I describe plants in different seasons? <i>(NC Objective: observe changes across the four seasons)</i> 3. Can I describe different types of weather? <i>(NC Objective: observe and describe weather associated with the seasons and how day length varies)</i>	ENQUIRY QUESTIONS: 1. Can I describe what the weather is like in different seasons? <i>(NC Objective: observe and describe weather associated with the seasons and how day length varies)</i> 2. Can I explain how much daylight we get in different seasons? <i>(NC Objective: observe and describe weather associated with the seasons and how day length varies)</i>
<b>YEAR</b> <b>3/4</b>	<b>ROCKS (Y3)</b> <b>CHEMISTRY</b> BIG QUESTION: Are all rocks and soils the same?	<b>LIGHT (Y3)</b> <b>PHYSICS</b> BIG QUESTION: What is the dark?	<b>ANIMALS INCLUDING HUMANS (Y3)</b> <b>BIOLOGY</b> BIG QUESTION: How do living things work?

	<p>PRIOR LEARNING: Everyday materials Y1; Uses of everyday materials Y2</p> <p>NEXT STEPS: Evolution and inheritance Y6; Physical Geography KS3</p>	<p>PRIOR LEARNING: Animals including humans Y1; Everyday materials Y1</p> <p>NEXT STEPS: Light Y6</p>	<p>PRIOR LEARNING: Animals including humans Y1; Animals including humans Y2</p> <p>NEXT STEPS: Animals including humans Y4; Animals including humans Y6</p>
	<p>Notes: Linked with work in geography, pupils should explore different kinds of rocks and soils, including those in the local environment.</p>	<p>Note: pupils should be warned that it is not safe to look directly at the sun, even when wearing dark glasses</p>	
	<p>Pupils might work scientifically by:</p> <ul style="list-style-type: none"> <li>observing rocks, including those used in buildings and gravestones, and exploring how and why they might have changed over time</li> <li>using a hand lens or microscope to help them to identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them</li> <li>research and discuss the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed</li> <li>explore different soils and identify similarities and differences between them and investigate what happens when rocks are rubbed together or what changes occur when they are in water</li> <li>raise and answer questions about the way soils are formed</li> </ul>	<p>Pupils might work scientifically by:</p> <ul style="list-style-type: none"> <li>looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes</li> </ul>	<p>Pupils might work scientifically by:</p> <ul style="list-style-type: none"> <li>identifying and grouping animals with and without skeletons and observing and comparing their movement</li> <li>exploring ideas about what would happen if humans did not have skeletons</li> <li>compare and contrast the diets of different animals (including their pets) and decide ways of grouping them according to what they eat</li> <li>research different food groups and how they keep us healthy, and design meals based on what they find out</li> </ul>
	<p>VOCABULARY: compare, group, different, type, rock, appearance, physical, properties, fossils, formed, lived, soils, organic, matter, similarities, differences, classify, particles, settling,</p>	<p>VOCABULARY: light, sight, see, dark, darkness, absence, observe, notice, reflect, reflected, surface, explore, mirror, reflective, behaves, protect, protection, shadows, formed, block, blocked, opaque, object, measure,</p>	<p>VOCABULARY: identify, animals, humans, types, amounts, nutrition, skeletons, muscles, support, protection, movement, functions, ribs, calcium, classify, connective tissue, contract, joint, relax, vertebra</p>

	<p>sedimentary, soft, chalk, rock, slate, granite, sandstone, scratch test, clay, sand, limestone, quartz, marble, stone, pebble, texture, absorbent, characteristic, surface</p>	<p>patterns, identify, transparent, direction, translucent, shortest, longest, highest, material, light source, Sun, night, day</p>	<p>(singular), vertebrae (plural), vertebrate, skull, spine, rib cage, hip, breastbone, shoulder</p>
	<p>POSSIBLE SCIENTISTS TO RESEARCH:  <a href="#">Breanna Green</a> (biogeochemist)  <a href="#">Anjana Khatwa</a> (geologist)</p>	<p>POSSIBLE SCIENTISTS TO RESEARCH:  <a href="#">Percy Shaw</a> (inventor of cats eyes in the road)</p>	<p>POSSIBLE SCIENTISTS TO RESEARCH:  <a href="#">Marie Curie</a> (first mobile xray machine)  <a href="#">Michelle Williams</a> (radiologist)</p>
	<p>ENQUIRY QUESTIONS:</p> <ol style="list-style-type: none"> <li>1. <a href="#">Can I observe and describe the properties of rocks?</a> (NC Objective: Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties)</li> <li>2. <a href="#">Can I test and compare rocks based on their hardness?</a> (NC Objective: Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties)</li> <li>3. <a href="#">Can I investigate the properties of rocks? Can they be scratched, are they porous or can they float?</a> (NC Objective: Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties)</li> <li>4. <a href="#">Can I describe how are fossils formed?</a> (NC Objective: Describe in simple terms how fossils are formed when things that have lived are trapped within rock)</li> <li>5. <a href="#">What is soil made from?</a> (NC Objective: Recognise that soils are made from rocks and organic matter)</li> </ol>	<p>ENQUIRY QUESTIONS:</p> <ol style="list-style-type: none"> <li>1. <a href="#">What is a light source? How do we see?</a> (NC Objective: Recognise that they need light in order to see things and that dark is the absence of light)</li> <li>2. <a href="#">Can I identify whether an object is a light source or a reflector? How is light reflected from surfaces?</a> (NC Objective: Notice that light is reflected from surfaces. Explore what happens when light reflects off a mirror or other reflective surfaces, including playing mirror games to help them to answer questions about how light behaves)</li> <li>3. <a href="#">Why is it dangerous to look at the light from the Sun? How can we protect our eyes from bright light?</a> (NC Objective: Recognise that light from the sun can be dangerous and that there are ways to protect their eyes; they should think about why it is important to protect their eyes from bright lights)</li> <li>4. <a href="#">How are shadows formed?</a> (Nc Objective: Recognise that shadows are formed when the light from a light source is blocked by an opaque object)</li> <li>5. <a href="#">Can I explain the terms opaque, transparent and translucent? Can I group objects</a></li> </ol>	<p>ENQUIRY QUESTIONS:</p> <ol style="list-style-type: none"> <li>1. <a href="#">How do animals including humans get the right types and amount of nutrition?</a> (NC Objectives: Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat)</li> <li>2. <a href="#">Can I explain how many portions of food from different food groups we should eat each day?</a> (NC Objectives: Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat)</li> <li>3. <a href="#">Can I classify animals as being herbivores, carnivores or omnivores and suggest what types of food they might eat?</a> (NC Objectives: Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat)</li> <li>4. <a href="#">What are the basic functions of the human skeleton and can I name the main bones?</a> (NC Objective: Identify that humans and some</li> </ol>



	<p>6. Can I examine what a soil sample is made from? (NC Objective: Recognise that soils are made from rocks and organic matter)</p>	<p>according to these properties? (NC Objective: Recognise that shadows are formed when the light from a light source is blocked by an opaque object)</p> <p>6. Are we able to change the size of shadows? (NC Objective: Measure and find patterns in the way that the size of shadows change)</p>	<p>other animals have skeletons and muscles for support, protection and movement)</p> <p>5. How do muscles work? (NC Objective: Identify that humans and some other animals have skeletons and muscles for support, protection and movement)</p> <p>6. What special functions do different parts of our bodies have? (NC Objective: Find out how different parts of the body have special functions)</p>
<p><b>STATES OF MATTER (Y4)</b> <b>CHEMISTRY</b></p> <p>BIG QUESTION: Is water always wet?</p>		<p><b>SOUND (Y4)</b> <b>PHYSICS</b></p> <p>BIG QUESTION: How do we hear different sounds?</p>	
<p>PRIOR LEARNING: Everyday materials Y1; Uses of everyday materials Y2</p> <p>NEXT STEPS: Properties and changes of materials Y5;</p>		<p>PRIOR LEARNING: Animals including humans Y1</p> <p>NEXT STEPS: Physics KS3</p>	
<p><b>Note:</b> teachers should avoid using materials where heating is associated with chemical change, for example, through baking or burning</p>			
<p>Pupils might work scientifically by:</p> <ul style="list-style-type: none"> <li>grouping and classifying a variety of different materials</li> <li>exploring the effect of temperature on substances such as chocolate, butter, cream (for example, to make food such as chocolate crispy cakes and ice-cream for a party)</li> <li>They could research the temperature at which materials change state, for example,</li> </ul>		<p>Pupils might work scientifically by:</p> <ul style="list-style-type: none"> <li>finding patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses</li> <li>making earmuffs from a variety of different materials to investigate which provides the best insulation against sound</li> </ul>	

	<p>when iron melts or when oxygen condenses into a liquid</p> <ul style="list-style-type: none"> <li>• They might observe and record evaporation over a period of time, for example, a puddle in the playground or washing on a line, and investigate the effect of temperature on washing drying or snowmen melting</li> </ul>	<ul style="list-style-type: none"> <li>• making and playing their own instruments by using what they have found out about pitch and volume</li> </ul>	
	<p>VOCABULARY: compare, group, classify, solids, liquids, gases, explore, every day, materials, describe, descriptions, state, matter, pool, pile, unsealed, escape, heated, cooled, measure, temperature, Celsius, degrees, observe, identify, evaporation, condensation, cycle, rate, particles, strong, weak, flexible, transparent, melt, freeze, solidify, dissolve, solution, filter, undissolved, dissolved, separate, sieve, mix</p>	<p>VOCABULARY: sounds, pitch, loudness, vibrate, vibration, muffle, tuning, quiet, soft, noise, sound, source, loud, high, low, vibrating, soundproof, medium, travel, patterns, features, characteristics, produce, change, increases, distance, fainter, strength, explore, identify</p>	
	<p>POSSIBLE SCIENTISTS TO RESEARCH: <a href="#">Daniel Fahrenheit</a> (invented Fahrenheit scale and the thermometer) <a href="#">Anders Celsius</a> (invented Celsius scale) <a href="#">John Boyd Dunlop</a> (inventor of pneumatic tyre)</p>	<p>POSSIBLE SCIENTISTS TO RESEARCH: <a href="#">Aristotle</a> (discovered how sound travels through air) <a href="#">Isaac Newton</a> (measured the speed of sound)</p>	
	<p>ENQUIRY QUESTIONS:</p> <ol style="list-style-type: none"> <li>1. <a href="#">What does solid, liquid and gas mean?</a> (NC Objective: 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)</li> <li>2. <a href="#">Can I group substances according to whether they are solids, liquids or gases?</a> (NC</li> </ol>	<p>ENQUIRY QUESTIONS:</p> <ol style="list-style-type: none"> <li>1. <a href="#">How is sound made and how do I hear?</a> (NC Objective: Identify how sounds are made, associating some of them with something vibrating; Recognise that vibrations from sounds travel through a medium to the ear)</li> <li>2. <a href="#">How well does sound travel through different materials?</a> (NC Objectives: Recognise that vibrations from sounds travel through a medium to the ear)</li> </ol>	

	<p><i>Objective: Compare and group materials together, according to whether they are solids, liquids or gases)</i></p> <p>3. <b>Can I explain how materials change state?</b> <i>(NC Objective: Compare and group materials together, according to whether they are solids, liquids or gases)</i></p> <p>4. <b>Can I investigate the melting point of 3 familiar materials (ice, chocolate and butter)?</b> <i>(NC Objective: 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)</i></p> <p>5. <b>What happens to water when it is heated or cooled? Can water be a solid, liquid and a gas?</b> <i>(NC Objective: Pupils should observe water as a solid, a liquid and a gas and should note the changes to water when it is heated or cooled)</i></p> <p>6. <b>Can I explain the importance of temperature in the water cycle and show this by making a solar still?</b> <i>(NC Objective: Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature)</i></p>	<p>3. <b>Can I place different sounds in order of pitch?</b> <i>(NC Objective: find patterns between the pitch of a sound and the features of the object that produced it)</i></p> <p>4. <b>Can I make a tuned string instrument? – optional if you have time</b> <i>(NC Objective: find patterns between the pitch of a sound and the features of the object that produced it)</i></p> <p>5. <b>Can I investigate how to affect the volume of a percussion instrument?</b> <i>(NC Objective: find patterns between the volume of a sound and the strength of the vibrations that produced it)</i></p> <p>6. <b>How does the strength of vibrations affect the volume of a sound?</b> <i>(NC Objective: find patterns between the volume of a sound and the strength of the vibrations that produced it)</i></p> <p>7. <b>Can I investigate how distance affects how well we can hear sound?</b> <i>(NC Objective: recognise that sound gets fainter as the distance from the sound source increases)</i></p>	
<p><b>YEAR</b> <b>5/6</b></p>	<p><b>PROPERTIES AND CHANGES OF MATERIALS (Y5)</b> <b>CHEMISTRY</b></p> <p>BIG QUESTION: What are things made of and why? Can we change materials?</p>	<p><b>ANIMALS INCLUDING HUMANS (Y6)</b> <b>BIOLOGY</b></p> <p>BIG QUESTION: How do our choices affect how our bodies work?</p>	<p><b>LIVING THINGS AND THEIR HABITATS (Y5)</b> <b>BIOLOGY</b></p> <p>BIG QUESTION: Do all lifecycles look the same?</p>

	<p>PRIOR LEARNING: Uses of everyday materials Y2; Forces and magnets Y3; States of matter Y4;</p> <p>NEXT STEPS: Chemistry KS3</p>	<p>PRIOR LEARNING: Animals including humans Y2; Animals including humans Y3; Animals including humans Y4</p> <p>NEXT STEPS: Biology KS3</p>	<p>PRIOR LEARNING: Animals including humans Y5; Plants Y3</p> <p>NEXT STEPS: Biology KS3</p>
	<p>Note:</p> <ul style="list-style-type: none"> <li>• Pupils are not required to make quantitative measurements about conductivity and insulation at this stage.</li> <li>• 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.</li> <li>• Safety guidelines should be followed when burning materials</li> </ul>		<p>Notes:</p> <ul style="list-style-type: none"> <li>• Pupils should study and raise questions about their local environment throughout the year.</li> <li>• They should observe life-cycle changes in a variety of living things, for example, plants in the vegetable garden or flower border, and animals in the local environment.</li> </ul>
	<p>Pupils might work scientifically by:</p> <ul style="list-style-type: none"> <li>• Carrying out tests to answer questions, for example, ‘Which materials would be the most effective for making a warm jacket, for wrapping ice cream to stop it melting, or for making blackout curtains?’</li> <li>• They might compare materials in order to make a switch in a circuit</li> <li>• They could observe and compare the changes that take place, for example, when burning different materials or baking bread or cakes</li> <li>• They might research and discuss how chemical changes have an impact on our lives, for example, cooking, and discuss the creative use of new materials such as polymers, super-sticky and super-thin materials</li> </ul>	<p>Pupils might work scientifically by:</p> <ul style="list-style-type: none"> <li>• exploring the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health</li> </ul>	<p>Pupils might work scientifically by:</p> <ul style="list-style-type: none"> <li>• observing and comparing the life cycles of plants and animals in their local environment with other plants and animals around the world (in the rainforest, in the oceans, in desert areas and in prehistoric times),</li> <li>• asking pertinent questions and suggesting reasons for similarities and differences.</li> <li>• They might try to grow new plants from different parts of the parent plant, for example, seeds, stem and root cuttings, tubers, bulbs.</li> <li>• They might observe changes in an animal over a period of time (for example, by hatching and rearing chicks), comparing how different animals reproduce and grow.</li> </ul>

	<p>VOCABULARY: reversible, irreversible, changes, melting, freezing, evaporating, condensing, dissolving, filtering, sieving, separating, burning, insoluble, solid, liquid, gas, materials, mixing, changes of state, formation, rusting, acid, chemist, invented, comparative, fair test</p>	<p>VOCABULARY: diet, balanced, side effect, fats, sugars, starches, food types, heart, circulation, heartbeat, pulse, pulse rate, muscle, blood, blood vessel, lung, breathe, growth, activity, skeletal, muscular, digestive, circulatory system, function, impact, exercise, damage, substances</p>	<p>VOCABULARY: life cycles, reproduce, reproduction, stamen, stigma, sepal, petal, ovary, pollen, style, germinate, germination, fertilise, fertilisation, pollinate, pollination, disperse, dispersal, babyhood, childhood, adolescence, adulthood, mammal, amphibian, sexual, asexual, naturalists, behaviourist</p>
	<p>POSSIBLE SCIENTISTS TO RESEARCH: <a href="#">Spencer Silver &amp; Arthur Fry</a> (invented post it notes) <a href="#">Ruth Benerito</a> (invented wrinkle-free cotton)</p>	<p>POSSIBLE SCIENTISTS TO RESEARCH: <a href="#">Santorio Santorio</a> (invented pulse measurement device) <a href="#">Richard Doll</a> (proved the link between lung cancer and smoking)</p>	<p>POSSIBLE SCIENTISTS TO RESEARCH: <a href="#">David Attenborough</a> (TV presenter &amp; naturalist) <a href="#">Jane Goodall</a> (studied chimpanzees)</p>
	<p>ENQUIRY QUESTIONS:</p> <ol style="list-style-type: none"> <li>1. Are materials able to be grouped or compared according to their properties? Which materials are soluble, transparent, conductive or magnetic? <i>(NC Objective: 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)</i></li> <li>2. What is a solution? How can a substance be recovered from a solution? <i>(NC Objective: know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution)</i></li> <li>3. Using your knowledge of solids, liquids and gases, are you able to decide how mixtures might be separated? <i>(NC Objective: use knowledge of solids, liquids and gases to decide how mixtures might be separated,</i></li> </ol>	<p>ENQUIRY QUESTIONS:</p> <ol style="list-style-type: none"> <li>1. What are the main parts of the human circulatory system and what are their functions? <i>(NC Objectives: identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood)</i></li> <li>2. What are the functions of the heart, blood vessels and blood? <i>(NC Objectives: identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood)</i></li> <li>3. Can I explain how the heart works and conduct an investigation into the effect of exercise on heart rate? <i>(NC Objectives: identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood; recognise the impact of diet, exercise,</i></li> </ol>	<p>ENQUIRY QUESTIONS:</p> <ol style="list-style-type: none"> <li>1. Can I explain and describe the process of sexual reproduction in flowering plants? <i>(NC Objective: describe the life process of reproduction in some plants and animals)</i></li> <li>2. Can I explain and describe the process of asexual reproduction in plants? <i>(NC Objective: describe the life process of reproduction in some plants and animals)</i></li> <li>3. Can I explain and describe the process of sexual reproduction in animals? <i>(NC Objective: describe the life process of reproduction in some plants and animals)</i></li> <li>4. Can I observe and compare the life cycles of animals in our local environment with other animals around the world? <i>(NC Objective: describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird)</i></li> <li>5. Can I compare how different animals reproduce and grow? <i>(NC Objective:</i></li> </ol>

	<p><i>including through filtering, sieving and evaporating)</i></p> <p>4. Can you design an investigation to demonstrate particular uses for everyday materials such as metals, wood and plastic? <i>(NC Objective: give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic)</i></p> <p>5. Are dissolving, mixing and changes of state reversible or irreversible changes? <i>(NC Objective: demonstrate that dissolving, mixing and changes of state are reversible changes)</i></p> <p>6. Are all changes reversible? What is the difference between melting and dissolving? <i>(Common misconceptions – optional lesson)</i></p> <p>7. Do some changes result in the formation of new materials? Explain why these changes are reversible or irreversible? <i>(NC Objective: 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)</i></p> <p>8. How do chemists create new materials? Who invented the glue for post-it notes? Who invented wrinkle-free cotton? Were these discoveries useful? – <i>possible homework/ independent research task</i> <i>(NC Objective: explain that some changes result in the formation of new materials, and that this</i></p>	<p><i>drugs and lifestyle on the way their bodies function)</i></p> <p>4. How do diet, exercise, drugs and lifestyle impact on the way that our bodies function? <i>(NC Objective: recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function)</i></p> <p>5. How can we keep our bodies healthy? What substances are damaging to our bodies? <i>(NC Objective: recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function)</i></p> <p>6. How are nutrients and water transported within animals including humans? <i>(NC Objective: describe the ways in which nutrients and water are transported within animals, including humans)</i></p>	<p><i>describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird)</i></p> <p>6. Can I find out about the work of naturalists and research the work of a famous naturalist? <i>(NC Objective: find out about famous scientists)</i></p>
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	<p><i>kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda)</i></p>		
		<p><b>FORCES (Y5)</b> <b>PHYSICS</b></p> <p>BIG QUESTION: How do things move?</p>	<p><b>LIVING THINGS AND THEIR HABITATS (Y6)</b> <b>BIOLOGY</b></p> <p>BIG QUESTION: Living things: what's the same and what's different?</p>
		<p>PRIOR LEARNING: Forces and magnets Y3</p> <p>NEXT STEPS: Physics KS3</p>	<p>PRIOR LEARNING: Living things and their habitats Y4; Living things and their habitats Y5</p> <p>NEXT STEPS: Biology KS3</p>
		<p>Pupils might work scientifically by:</p> <ul style="list-style-type: none"> <li>exploring falling paper cones or cupcake cases, and designing and making a variety of parachutes and carrying out fair tests to determine which designs are the most effective</li> <li>They might explore resistance in water by making and testing boats of different shapes</li> <li>They might design and make products that use levers, pulleys, gears and/or springs and explore their effects</li> </ul>	<p>Pupils might work scientifically by:</p> <ul style="list-style-type: none"> <li>using classification systems and keys to identify some animals and plants in the immediate environment</li> <li>they could research unfamiliar animals and plants from a broad range of other habitats and decide where they belong in the classification system</li> </ul>
		<p>VOCABULARY:</p> <p>gravity, air resistance, water resistance, friction, surface, force, effect, move, accelerate, decelerate, stop, change direction, brake, mechanism, pulley, gear, spring, theory of gravitation, Galileo Galilei, Isaac Newton</p>	<p>VOCABULARY:</p> <p>classify, compare, Linnaen, Carl Linnaeus, classification, domain, kingdom, phylum, class, order, family, genus, species, characteristics, vertebrates, invertebrates, microorganisms, organism, flowering, non-flowering</p>

		<p>POSSIBLE SCIENTISTS TO RESEARCH:  <a href="#">Archimedes</a> (theories about pulleys and levers)  <a href="#">George Cayley</a> (first glider to support a human)  <a href="#">Isaac Newton</a> (gravity – will have researched him in Year 3/4)</p>	<p>POSSIBLE SCIENTISTS TO RESEARCH:  <a href="#">Carl Linnaeus</a> (created a classification system of living things)  <a href="#">Beatrix Potter</a> (mycologist – study of mushrooms - and illustrator)</p>
		<p>ENQUIRY QUESTIONS:</p> <ol style="list-style-type: none"> <li>1. Can I explain how unsupported objects fall towards Earth? <i>(NC Objective: explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object)</i></li> <li>2. Can I explain the effects of friction and how it affects movement? <i>(NC Objective: identify the effects of air resistance, water resistance and friction, that act between moving surfaces)</i></li> <li>3. Can I identify and explain the effects of air resistance? <i>(NC Objective: identify the effects of air resistance, water resistance and friction, that act between moving surfaces)</i></li> <li>4. Can I identify and explain the effects of water resistance? <i>(NC Objective: identify the effects of air resistance, water resistance and friction, that act between moving surfaces)</i></li> <li>5. Can I recognise that levers and pulleys allow a smaller force to have a greater effect? <i>(NC Objective: recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect)</i></li> <li>6. Can I explain why gears allow a smaller force to have a greater effect? <i>(NC Objective: recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect)</i></li> </ol>	<p>ENQUIRY QUESTIONS:</p> <ol style="list-style-type: none"> <li>1. Can you build on your knowledge about grouping living things in Year 4 by looking at the classification system in more detail? <i>(NC Objective: describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals)</i></li> <li>2. Can I explore ways of distinguishing between organisms that have similar characteristics?? <i>(NC Objective: describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals)</i></li> <li>3. Can I classify plants according to their characteristics? <i>(NC Objective: give reasons for classifying plants and animals based on specific characteristics)</i></li> <li>4. Can I find out about Karl Linnaeus and his classification system? <i>(NC Objective: describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals)</i></li> </ol>



			<p>5. Can I identify some common British trees using classification keys? <i>(NC Objective: give reasons for classifying plants and animals based on specific characteristics)</i></p> <p>6. Can I identify invertebrates using micro-habitats in our local environment? <i>(NC Objective: give reasons for classifying plants and animals based on specific characteristics)</i></p>
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