
	States of Matter		Rocks and Soils	Electricity	Living things and their Habitats	Sound
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Key Vocabulary	Solid, liquid, gas, state change, melting, freezing, melting point, boiling point, evaporation/evaporate, temperature, degrees Celsius, condense/condensation, air, oxygen, ice/water/steam, heated/heating, cool/cooling, melt, freeze, solidify, boil, water cycle, precipitation, transpiration		Rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, soil, fossil, marble, chalk, granite, sandstone, slate, soil, peat, sandy/chalk/clay soil, permeable/impermeable, durable, hardwearing	Electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol	Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate, amphibians, reptiles, birds, mammals, vertebrates, invertebrates	Sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation, solid, liquid, gas, muffle,
Previous Knowledge	<p>Year 1</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.•Compare and group together a variety of everyday materials on the basis of their simple physical properties. <p>Year 2</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.		<p>Year 1</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.•Compare and group together a variety of everyday materials on the basis of their simple physical properties. <p>Year 2</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.	<p>EYFS</p> <p>Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.</p>	<p>Year 1</p> <ul style="list-style-type: none">•Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.•Identify and describe the basic structure of a variety of common flowering plants, including trees.•Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.•Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). <p>Year 2</p> <ul style="list-style-type: none">•Identify and name a variety of plants and animals in their habitats, including microhabitats.	<p>Year 1</p> <ul style="list-style-type: none">•Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.

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NC Objectives	<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.	<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.	<ul style="list-style-type: none">•Identify common appliances that run on electricity.•Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.•Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery.•Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.•Recognise some common conductors and insulators, and associate metals with being good conductors.	<ul style="list-style-type: none">•Recognise that living things can be grouped in a variety of ways.•Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.•Recognise that environments can change and that this can sometimes pose dangers to living things.	<ul style="list-style-type: none">•Identify how sounds are made, associating some of them with something vibrating.•Recognise that vibrations from sounds travel through a medium to the ear.•Find patterns between the pitch of a sound and features of the object that produced it.•Find patterns between the volume of a sound and the strength of the vibrations that produced it.•Recognise that sounds get fainter as the distance from the sound source increases.
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Misconceptions	<ul style="list-style-type: none">• ‘solid ’is another word for hard or opaque•solids are hard and cannot break or change shape easily and are often in one piece•substances made of very small particles like sugar or sand cannot be solids•particles in liquids are further apart than in solids and they take up more space•when air is pumped into balloons, they become lighter•water in different forms – steam, water, ice – are all different substances•all liquids boil at the same temperature as water (100 degrees)	<ul style="list-style-type: none">•melting, as a change of state, is the same as dissolving•steam is visible water vapour (only the condensing water droplets can be seen)•clouds are made of water vapour or steam•the substance on windows etc. is condensation rather than water•the changing states of water (illustrated by the water cycle) are irreversible•evaporating or boiling water makes it vanish•evaporation is when the Sun sucks up the water, or when water is absorbed into a surface/material.	<ul style="list-style-type: none">•rocks are all hard in nature•rock-like, man-made substances such as concrete or brick are rocks•materials which have been polished or shaped for use, such as a granite worktop, are not rocks as they are no longer ‘natural’•certain found artefacts, like old bits of pottery or coins, are fossils•a fossil is an actual piece of the extinct animal or plant•soil and compost are the same thing.	<ul style="list-style-type: none">•electricity flows to bulbs, not through them•electricity flows out of both ends of a battery•electricity works by simply coming out of one end of a battery into the component.	<ul style="list-style-type: none">•the death of one of the parts of a food chain or web has no or limited consequences on the rest of the chain•there is always plenty of food for wild animals•animals are only land-living creatures•animals and plants can adapt to their habitats, however they change•all changes to habitats are negative.	<ul style="list-style-type: none">•sound is only heard by the listener•sound only travels in one direction from the source•sound can’t travel through solids and liquids•high sounds are load and low sounds are quiet.
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	States of Matter	States of Matter	Rocks and Soils	Electricity	Living things and their Habitats	Sound
Key knowledge to be assessed	<ul style="list-style-type: none">•A solid keeps its shape and has a fixed volume. A liquid has a fixed volume but changes in shape to fit the container. A liquid can be poured and keeps a level, horizontal surface. A gas fills all available space; it has no fixed shape or volume.•Granular and powdery solids like sand can be confused with liquids because they can be poured, but when poured they form a heap and they do not keep a level surface when tipped. Each individual grain demonstrates the properties of a solid.•Melting is a state change from solid to liquid. Freezing is a state change from liquid to solid. The freezing point of water is 0oC. Boiling is a change of state from liquid to gas that happens when a liquid is heated to a specific temperature and bubbles of the gas can be seen in the liquid.		<ul style="list-style-type: none">•Rock is a naturally occurring material. There are different types of rock e.g. sandstone, limestone, slate etc. which have different properties.•Rocks can be hard or soft. They have different sizes of grain or crystal. They may absorb water.•Rocks can be different shapes and sizes (stones, pebbles, boulders).•Soils are made up of pieces of ground down rock which may be mixed with plant and animal material (organic matter).	<ul style="list-style-type: none">•Many household devices and appliances run on electricity. Some plug in to the mains and others run on batteries.•An electrical circuit consists of a cell or battery connected to a component using wires. If there is a break in the circuit, a loose connection or a short circuit, the component will not work.•A switch can be added to the circuit to turn the component on and off. Metals are good conductors so they can be used as wires in a circuit.	<ul style="list-style-type: none">•Living things can be grouped (classified) in different ways according to their features.•Classification keys can be used to identify and name living things.•Living things live in a habitat which provides an environment to which they are suited.•These environments may change naturally e.g. through flooding, fire, earthquakes etc.•Humans also cause the environment to change. This can be in a good way (i.e. positive human impact, such as setting up	<ul style="list-style-type: none">•A sound produces vibrations which travel through a medium from the source to our ears. Different mediums such as solids, liquids and gases can carry sound, but sound cannot travel through a vacuum (an area empty of matter).•The vibrations cause parts of our body inside our ears to vibrate, allowing us to hear (sense) the sound.•The loudness (volume) of the sound depends on the strength (size)of vibrations which decreases as they travel through the

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		<ul style="list-style-type: none">•Water boils when it is heated to 100oC. Evaporation is the same state change as boiling (liquid to gas),but it happens slowly at lower temperatures and only at the surface of the liquid.•Evaporation happens more quickly if the temperature is higher, the liquid is spread out or it is windy.•Condensation is the change back from a gas to a liquid caused by cooling.•Water at the surface of seas, rivers etc. evaporates into water vapour (a gas). This rises, cools and condenses back into a liquid forming clouds. When too much water has condensed, the water droplets in the cloud get too heavy and fall back down as rain, snow, sleet etc. and drain back into rivers etc. This is known as precipitation. This is the water cycle.		<ul style="list-style-type: none">•The type of rock, size of rock pieces and the amount of organic matter affect the property of the soil.•Some rocks contain fossils. Fossils were formed millions of years ago.•When plants and animals died, they fell to the seabed. They became covered and squashed by other material. Over time the dissolving animal and plant matter is replaced by minerals from the water.		<ul style="list-style-type: none">•Non-metallic solids are insulators except for graphite (pencil lead).•Water, if not completely pure, also conducts electricity.		nature reserves)or in a bad way (i.e. negative human impact, such as littering). <ul style="list-style-type: none">•These environments also change with the seasons; different living things can be found in a habitat at different times of the year.		medium. Therefore, sounds decrease in volume as you move away from the source. <ul style="list-style-type: none">•A sound insulator is a material which blocks sound effectively.•Pitch is the highness or lowness of a sound and is affected by features of objects producing the sounds. For example, smaller objects usually produce higher pitched sounds.	
What does this look like at Bramhope?	Resources	Different materials to classify and group Chocolate, butter for melting Ice trays Thermometers	Different materials to classify and group Chocolate, butter for melting Ice trays Thermometers	Rock samples Magnifying glasses Soil samples Pipettes	Batteries Wires Bulbs Buzzers Switches Different materials (insulators and conductors)				Instruments Pitch forks iPad app – Arduino		
	Activities	<ul style="list-style-type: none">•Observe closely and classify a range of solids including solids made of small particles like rice which can be poured but are not liquid. Observe closely and classify a range of liquids.•Explore making gases visible e.g. squeezing sponges under water to see bubbles, and showing their effect e.g. using straws to blow objects, trees moving in the wind.•Classify materials according to whether they are solids, liquids and gases.•Observe a range of materials melting e.g. ice, chocolate, butter.•Investigate how to melt ice or chocolate buttons more quickly.	<ul style="list-style-type: none">•Explore freezing different liquids e.g. tomato ketchup, oil, shampoo.•Use secondary sources to research melting points of different materials.•Set up investigations to explore changing the rate of evaporation e.g. washing, puddles, handprints on paper towels, liquids in containers.•Use secondary sources to find out about the water cycle. Create water cycle in ziplock bag and attach to the window to see the evaporation and condensation process.	<ul style="list-style-type: none">• Observe rocks closely including rocks found on school sight and rocks in local area.• Classify rocks in a range of ways, based on their appearance.• Devise a test to investigate the hardness of a range of rocks.• Devise a test to investigate how much water different rocks absorb.• Observe how rocks change over time e.g. gravestones or old building in local area.• Research using secondary sources how fossils are formed.• Observe soils closely including samples from school garden.• Classify soils in a range of ways based on their appearance.• Observe how soil can be separated through sedimentation. Mix soils in with water to then observe the different layers.	<ul style="list-style-type: none">•Construct a range of circuits incorporating bulbs, switches and buzzers.•Explore which materials can be used instead of wires to make a circuit.•Classify the materials that were suitable/not suitable for wires.•Explore how to connect a range of different switches and investigate how they function in different ways.•Apply their knowledge of conductors and insulators to design and make different types of switch.•Investigate ‘broken’ circuits and fix them using knowledge of circuits.•Make circuits that can be controlled as part of a DT project. Remember children do not need to learn circuit symbols at this stage.	<ul style="list-style-type: none">•Observe plants and animals in different habitats throughout the year using school garden.• Compare and contrast the living things observed.• Use classification keys to name unknown living things.• Classify living things found in different habitats based on their features.• Create a simple identification key based on observable features.• Use fieldwork to explore human impact on the local environment e.g. litter, tree planting.• Use secondary sources to find out about how environments may naturally change.• Use secondary sources to find out about human impact, both positive and negative, on environments.	<ul style="list-style-type: none">•Classify sound sources.•Explore making sounds with a range of objects, such as musical instruments and other household objects.•Explore how string telephones work.•Explore altering the pitch or volume of objects, such as the length of a guitar string, amount of water in bottles, size of tuning forks.•Measure sounds over different distances.•Measure sounds through different insulation materials.				
	Enrichment				Local walk – observe rocks used for different purposes including visit to churchyard to look at gravestones and changes in rock over time.				Science Media Museum – Sound Day		
	Cross Curricular links/Texts	Stick Dog Dreams of Ice Cream—Tom Watson George’s Marvellous Medicine —Roald Dahl The Great Big Water Cycle Adventure The Rhythm of the Rain DT – making rocky road cakes or ice cream.			A Pebble in My Pocket—Meredith Hooper Stone Girl, Bone Girl—Laurence Anholt Reading – learning about the life of Mary Anning Geography – natural resources Art – making clay ‘mold and cast’ fossils Sketching fossils	DT – design a wire buzzer game.	Beetle Boy—M G Leonard What a waste Greta and the Giants Geography – human and physical geography looking at animals in different habitats across the world and threats faced. Explore local area – look at new building development and its impact. Litter pick in local area. Art – observational drawings – Darwins.	Music – making/playing musical instruments to learn about pitch and volume. Computing – using iPads and Arduino app to measure volume. Moses Goes to a Concert by Isaac Millman The Sound of Silence—Katrina Goldasito & Julia Kuo			

Working Scientifically Skills –

Taken from PLAN progression in working scientifically document

Asking questions and recognising they can be answered in different ways	Making observations and taking measurements	Engaging in practical enquiry to answer questions	Recording and presenting evidence	Answering questions and concluding	Evaluating and raising questions and predictions	Communicating their findings
<p>Asking relevant questions and using different types of scientific enquiries to answer them</p> <ul style="list-style-type: none"> The children consider their prior knowledge when asking questions. They independently use a range of question stems. Where appropriate, they answer these questions. The children answer questions posed by the teacher. Given a range of resources, the children decide for themselves how to gather evidence to answer the question. They recognise when secondary sources can be used to answer questions that cannot be answered through practical work. They identify the type of enquiry that they have chosen to answer their question. 	<p>Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers</p> <ul style="list-style-type: none"> The children make systematic and careful observations. They use a range of equipment for measuring length, time, temperature and capacity. They use standard units for their measurements. 	<p>Setting up simple practical enquiries, comparative and fair tests</p> <ul style="list-style-type: none"> The children select from a range of practical resources to gather evidence to answer questions generated by themselves or the teacher. They follow their plan to carry out: observations and tests to classify; comparative and simple fair tests; observations over time; and pattern seeking. <p>Explanatory note A comparative test is performed by changing a variable that is qualitative e.g. the type of material, shape of the parachute. This leads to a ranked outcome. A fair test is performed by changing a variable that is quantitative e.g. the thickness of the material or the area of the canopy. This leads to establishing a causative relationship.</p>	<p>Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</p> <ul style="list-style-type: none"> The children sometimes decide how to record and present evidence. They record their observation e.g. using photographs, videos, pictures, labelled diagrams or writing. They record their measurements e.g. using tables, tally charts and bar charts (given templates, if required, to which they can add headings). They record classifications e.g. using tables, Venn diagrams, Carroll diagrams. Children are supported to present the same data in different ways in order to help with answering the question. 	<p>Using straightforward scientific evidence to answer questions or to support their findings</p> <ul style="list-style-type: none"> Children answer their own and others' questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. The answers are consistent with the evidence. Identifying differences, similarities or changes related to simple scientific ideas and processes Children interpret their data to generate simple comparative statements based on their evidence. They begin to identify naturally occurring patterns and causal relationships. Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions They draw conclusions based on their evidence and current subject knowledge. 	<p>Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</p> <ul style="list-style-type: none"> They identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry. Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions Children use their evidence to suggest values for different items tested using the same method e.g. the distance travelled by a car on an additional surface. Following a scientific experience, the children ask further questions which can be answered by extending the same enquiry. 	<p>Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</p> <ul style="list-style-type: none"> They communicate their findings to an audience both orally and in writing, using appropriate scientific vocabulary.

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Outdoor Learning Opportunities – Any activities in **bold** must be taught outdoors.

		Year 4	
		National Curriculum Statements	Possible Outdoor Learning things and the
Year 3			
National Curriculum Statements	Possible Outdoor Learning		
Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.	Pupils talk about the properties of rocks in the playground or wildlife garden. Pupils could go on a local walk around Bramhope to observe different rock types (stone) and discuss the effects of weathering on stone over time.	Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.	Pupils use classification keys to name living things seen in the playground or local environment and identify.
		Recognise that environments can change and that this can sometimes pose dangers to living things.	Pupils carry out litter surveys in the playground or local area/local park and consider the impact on the environment.
			Sound
Recognise that soils are made from rocks and organic matter.	Pupils dig in the soil in the wildlife garden to look for rocks and organic matter. Check for worms.	Recognise that sounds get fainter as the distance from the sound source increases.	Pupils measure how the volume of a sound changes as they move away from the sound source.
		Recognise that vibrations from sounds travel through a medium to the ear.	Pupils to tap different wooden and metal objects outside to see if they can hear if they put their hands on them. Pupils to make and use string telephones outdoors to see if sound travels through a medium and if a string make a difference?
			States of Matter
		Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature	Pupils to go outside on a day where it has been raining and make observations throughout the day and record the diameter of puddles throughout the day and record.