Anston Greenlands Primary School

Mapping progression for Science across EYFS to KS2

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Our learning aims:

FS2 - Understanding the World Education Programme

Understanding the world involves guiding children to make sense of their physical world and their community. The frequency and range of children's personal experiences increases their knowledge and sense of the world around them – from visiting parks, libraries and museums to meeting important members of society such as police officers, nurses and firefighters. In addition, listening to a broad selection of stories, non-fiction, rhymes and poems will foster their understanding of our culturally, socially, technologically and ecologically diverse world. As well as building important knowledge, this extends their familiarity with words that support understanding across domains. Enriching and widening children's vocabulary will support later reading comprehension.

ELG: The Natural World

- Explore the natural world around them, making observations and drawing pictures of animals and plants;
- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class;
-Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

* *The ELG is an assessment checkpoint and should not be used as a curriculum – the curriculum should be broad and balanced with a range of experiences and opportunities not limited to teaching to the ELG.*

In Key Stage 1 children will learn:
Taken from National Curriculum

The principal focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.
'Working scientifically' is described separately in the programme of study, but must always be taught through and clearly related to the teaching of substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content. Pupils should read and spell scientific vocabulary at a level consistent with their increasing word-reading and spelling knowledge at key stage 1.

In Lower Key Stage 2 children will learn:
Taken from National Curriculum

The principal focus of science teaching in lower key stage 2 is to enable pupils to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.
'Working scientifically' is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content. Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word-reading and spelling knowledge.

In Upper Key Stage 2 children will learn:
Taken from National Curriculum

The principal focus of science teaching in upper key stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically.
At upper key stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.
'Working and thinking scientifically' is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.

Contents

Key
Knowledge
Skills
Working Scientifically
Objectives taken from another Science unit.

Areas of Learning

Year1	Year 2	Year 3	Year 4	Year 5	Year 6
Plants Animals including humans Everyday materials Seasonal changes	Plants Living things and their habitats Animals including humans Uses of everyday materials	Plants Animals including humans Rocks Light Forces and magnetism	Plants (some coverage) Living things and their habitats Animals including humans States of matter Sound Electircity	Plants (some coverage) Living things and their habitats Animals including humans Properties and changes of material Earth and Space Forces	Plants (some coverage) Living things and their habitats Animals including humans Light Electricity Evolution and inheritance

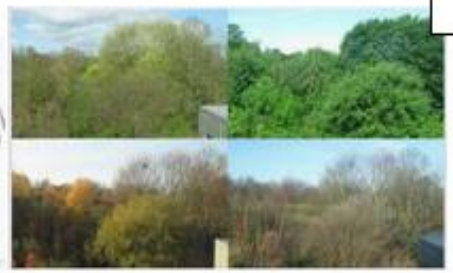
The Five Key Areas of Working Scientifically (Child friendly)

Comparative or fair testing

Research

Pattern seeking

Observations over time



Identifying and classifying

Working scientifically

EYFS	KS1	Lower KS2	Upper KS2
ELG : Use a range of Scientific equipment to help them develop their lines of enquiry.	During **Years 1 and 2,** pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:	During **Years 3 and 4,** pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:	During **Years 5 and 6,** pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:
Know that some specialist equipment can help us to understand the natural world and enhance our experiences.	Ask simple questions and recognising that they can be answered in different ways.	Ask relevant questions and use different types of scientific enquiries to answer them.	Plan different types of scientific enquiries to answer questions, include recognising and controlling variables where necessary.
Can handle equipment carefully, safely and appropriately.	Perform simple tests.	Set up simple practical enquiries, comparative and fair tests.	Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.
Can name a range of equipment that they use such as a pooter (insect catcher), magnifying glass, incubator, magnets.	Observe closely, use simple equipment	Make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.	Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
	Gather and recording data to help in answering questions.	Gather, record, classify and present data in a variety of ways to help in answering questions.	Identifying scientific evidence that has been used to support or refute ideas or arguments.
	Identify and classify.	Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.	Using test results to make predictions to set up further comparative and fair tests.
	Use their observations and ideas to suggest answers to questions.	Identify differences, similarities or changes related to simple scientific ideas and processes.	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.
		Use straightforward scientific evidence to answer questions or to support their findings.	

		Use results to draw simple conclusions, make predictions for new values and suggest improvements and raise further questions	
		Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.	
ELG : That there are key words/vocabulary associated with science.	**Children begin to use simple scientific language.**	**Pupils use relevant scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences.**	**Pupils should read, spell and pronounce scientific vocabulary correctly.**

(Equality of opportunity, inclusion, diversity and Cultural Capital – where possible, teach children about some of the scientists who work or have worked in some of the areas of science they study. Highlight the impact that some of their ideas have had on the world – e.g. medicines and vaccinations, transport and space travel etc. Challenge traditional concepts of 'the scientist' by including scientists from a range of backgrounds, countries, ethnicities, genders and sexualities).

Biology: Plants

EYFS ELG: That the world is made up of different animals and plants	Year 1 **What makes a flower?**	Year 2 **What do plants need to grow well?**	Year 3 **Why is sunlight so important for plants?**	Year 4	Year 5	Year 6
Know that some things are living and others are non- living; Know how to plant seeds and look after living plants to help them grow. Sort e.g. living things, into two simple groups, using given criteria. Communicate what they have learned through drawing or some other way of recording. Ask and answer questions about what they have observed. May ask and answer science based questions on first hand	Know the names a variety of common wild and garden plants, including deciduous and evergreen trees. Know and describe the basic structure of a variety of common flowering plants, including trees. Ask questions, recognising that they can be answered in different ways. Observe closely, using simple equipment. Performing simple tests. Identifying and classifying.	Know and describe how plants need water, light and a suitable temperature to grow and stay healthy. Observe and describe how seeds and bulbs grow into mature plants. Ask questions and recognise that they can be answered in different ways. Observe and record the growth of plants as they change over time. Set up a test- to show the conditions that plants need in order to be able to grow.	Know and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. Know the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant Know, through Investigations the way in which water is transported within plants. Ask relevant questions and use different types of scientific enquiries to answer them.	Know and use classification keys to help group, identify and name a variety of living things in their local and wider environment (plants can be grouped in to categories, such as flowering plants and non-flowering plants). Ask relevant and more complex questions and using different types of scientific enquiries to answer them. Gather, record, classify and present data in a variety of ways to help in answering questions. Record findings using simple scientific language, drawings, labelling diagrams,	Know and be able to describe the life process of reproduction in some **plants** (Living things and their habitats) Plan different types of scientific enquiries to answer questions including recognising and controlling variables where necessary. Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Record data and results ~~of increasing complexity~~ using	Know and be able to 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. Identification and classification. Know and give reasons for classifying **plants** and animals based on specific characteristics. Identification and classification-pattern seeking. Plan a variety of challenging scientific enquiries to answer

experiences and books.	Gather and record data to help in answering questions. Use their observations and ideas to suggest answers to questions	Use their observations and ideas to suggest answers to questions.	Set up simple practical enquiries, comparative and fair tests. Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. Record findings using simple scientific language, drawings, labelling diagrams, keys, bar charts, and tables. Use results to draw simple conclusions, make predictions for new values, suggest improvement and raise further questions. Use straightforward scientific evidence to answer question or to support their findings.	keys, bar charts, and tables. Identifying differences, similarities or changes related to simple scientific ideas and processes Using straightforward scientific evidence to answer questions or to support their findings.	scientific diagrams and labels, classification key, tables, scatter graphs, bar and line graphs. Use test results to make predictions to set up further comparative and fair tests. Report and present findings from enquiries, including conclusions, causal relationships and explanations~~,~~ in oral and written forms such as display and other presentations. Identify scientific evidence that has been used to support or refute ideas or arguments.	questions including recognising and controlling variables where necessary. Record data and results of increasing complexity using scientific diagrams and labels, classification key, tables, scatter graphs, bar and line graphs. 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 display and other presentations. Classification activities. Identifying scientific evidence that has been used to support or refute ideas or arguments

water, soil, seed, lifecycle, grow, sun, soil, similar, different.	Flower, grass, weed, wild plant, fruit Garden plant tree, deciduous evergreen, bud, bulb, petals, stem, leaves, berry, rose, clover, oak roots, dandelion, daisy buttercup, leaf nettles, ivy lavender beech, willow horse chestnut, trunk, bark branches, seeds. Record, observe,	Dispersal, wind, pollination, light, air, temperature, warmth, bulb, germination, healthy, unhealthy, roots.	Reproduction, nutrients, oxygen, transportation, absorb, produce, carbon dioxide, fertilise, support, seed dispersal, seed formation,	See other units.	See other units.	See other units.

Biology: Living Things and their habitats:

EYFS ELG: That there are similarities and differences in the natural world.	Year 2 Could a frog live in the same place as a bird?	Year 4 What would happen if there were no insects?	Year 5 Do plants and animals reproduce in the same way?	Year 6 Why is it useful to be able to classify living things?
Know that animals change as they grow and have life cycles. Know that the natural environment and world around them supports them to live and grow; Know how to respect and care for the natural environment and all living things; Know how to care for their immediate environment and the wider world; Know that there are different natural environments around the world that have specific characteristics such as deserts, forests, islands Communicate orally, in simple descriptions and explanations for example;	Know and be able to compare the differences between things that are living, dead, and things that have never been alive. Know 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 Know and be able to identify and name a variety of plants and animals in their habitats, including micro-habitats. Know and 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. Ask simple questions and recognise that they can be answered in different ways. Identify and classify.	Know that living things can be grouped in a variety of ways. Know and use classification keys to help group, identify and name a variety of living things in their local and wider environment. Know that environments can change and that this can sometimes pose dangers to living things. Ask relevant questions and using different types of scientific enquiries to answer them. Gather, record, classify and present data in a variety of ways to help in answering questions. Record findings using simple scientific language, drawings, labelling diagrams, keys, bar charts, and tables.	Know the differences in the life cycles of a mammal, an amphibian, an insect and a bird. Know and be able to describe the life process of reproduction in some plants and animals. Plan different types of scientific enquiries to answer questions including recognising and controlling variables where necessary. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Record data and results ~~of increasing complexity~~ using scientific diagrams and labels, classification key, tables, scatter graphs, bar and line graphs.	Know how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants, and animals. Know and give reasons for classifying plants and animals based on special characteristics. Know the role of variation in enabling living things to survive in the same ecosystem. Plan a variety of challenging scientific enquiries to answer questions including recognising and controlling variables where necessary. Record data and results of increasing complexity using scientific diagrams and labels, classification key, tables, scatter graphs, bar and line graphs.

Can comment on how two animals, are similar or different from each other; notice and describe how they change as they grow. Talk about a farm, which animals live there / plants grow there and the job of the farmer. Talk about their knowledge for example that some animal's habitats need certain conditions such as polar bears prefer to live in cold climates. Demonstrate this through their small world play and storytelling. Take part in activities such as recycling in school, rewilding projects, and traffic calming posters and develop an eco-conscious approach to classroom practices and resource.	Observe closely, using simple equipment. Perform simple tests. Use their observations and ideas to suggest answers to questions.	Identify differences, similarities or changes related to simple scientific ideas and processes. Use straightforward scientific evidence to answer questions or to support their findings.	Use test results to make predictions to set up further comparative and fair tests. 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 display and other presentations. Identify scientific evidence that has been used to support or refute ideas or arguments.	Report and present finding from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as display and other presentations. Identify scientific evidence that has been used to support or refute ideas or arguments.

Farm, animals, cows, sheep, pig, chickens, etc, young, cold, hot, alive, dead. Recycle. Lifecycle, tadpoles, frogs, frogspawn, froglets.	Living, dead, habitats, micro-habitats, food chain, seashore, woodland, forest, desert, rainforest, ocean, arctic, Antarctic. hot/cold/warm, Dry/damp/wet, Bright/shade/dark. Predator, prey, consumer, producer.	Environment, flowering/non-flowering plants, vertebrates, invertebrates, fish, amphibians, insects, birds, reptiles, mammals, **Human impact** (positive) nature reserves, , planned parks, (negative) deforestation, litter, population, developments.	Life process of reproduction, sexual, asexual, Naturalist, animal behaviourist, stamen, stigma, eggs.	Micro-organisms, key, classification, variation, eco-system, taxonomist, classification, plant, domain, kingdom, phylum, class, order, family, genus, Characteristics, animal Fungi, microorganism Vertebrate, invertebrate Homoeothermic, poikilothermic, virus, bacteria, funghi.

Biology: Animals, including humans

EYFS ELG: How science is used to help us.	Year 1 **Do all animals see, hear, smell and touch in the same way?**	Year 2 **Do all animals have the same lifecycle?**	Year 3 **Do all animals have skeletons?**	Year 4 **How can we tell what an animal eats from looking at its teeth?**	Year 5 **Does a baby human develop in the same way as a baby elephant?**	Year 6 **How does the human circulation system work?**
Know that science has helped us to live healthier lives for example understanding our bodies – link to oral hygiene Understand the importance of oral hygiene and how to look after their bodies and own personal hygiene.	Know and name a variety of common animals including fish, amphibians, reptiles, birds and mammals Know and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) Know, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. Know and name a variety of common animals that are carnivores, herbivores and omnivores. Ask question and recognising that they can be answered in different ways.	Know that animals, including humans, including humans, have offspring which grow into adults Know about and describe the basic needs of Animals, including humans, including humans, for survival (water, food and air) Know the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. Perform simple tests. Ask simple questions and recognise that they can be answered in different ways. Observe closely, using simple equipment.	Know that humans and some other animals have skeletons and muscles for support, protection and movement Know that Animals, including humans, 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 Ask relevant questions and use different types of scientific enquiries to answer them. Gather, record, classify and present data in a variety of ways to help in answering questions. Record findings using simple scientific language, drawings,	Describe the simple functions of the basic parts of the digestive system in humans. Know the different types of teeth in humans and their simple functions. Construct and interpret a variety of food chains, identifying producers, predators and prey. Ask relevant questions and using different types of scientific enquiries to answer them. Setting up simple practical enquiries, comparative and fair test. Making systematic and careful observations	Know the changes as humans develop to old age (including during gestation). Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. Describe the life process of reproduction in some plants and animals Plan different types of scientific enquiries to answer questions including recognising and controlling variables where necessary. Take measurements, using a range of scientific equipment, with some accuracy and precision, taking	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, drugs and lifestyle on the way their bodies function. Describe the ways in which nutrients and water are transported within animals, including humans. Plan different types of scientific enquiries to answer questions including recognising and controlling variables where necessary.

	Observe closely, using simple equipment. Identify and classify. Gather and record data to help in answering questions. Using their observations. And ideas to suggest answers to questions	Use their observations and ideas to suggest answers to questions.	labelling diagrams, keys, bar charts, and tables. Identify differences, similarities or changes related to simple scientific ideas and processes. Use straightforward scientific evidence to answer question or to support their findings.	and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. Gather, record, classify and present data in a variety of ways to help in answering questions. Record findings using simple scientific language, drawings, labelling diagrams, keys, bar charts, and tables. Use results to draw simple conclusions, make predictions for new values, suggest improvement and raise further questions. Identify differences, similarities or changes related to simple scientific ideas and processes. Use straightforward scientific evidence to	repeat readings when appropriate. Record data and results ~~of increasing complexity~~ using scientific diagrams and labels, classification key, tables, scatter graphs, bar and line graphs. 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 display and other presentations.	Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Recording data and results of increasing complexity using scientific diagrams and labels, classification key, tables, scatter graphs, bar and line graphs. Reporting and presenting finding from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as display and other presentations. Identify scientific evidence that has been used to support or refute ideas or arguments.

				answer question or to support their findings.		
Tooth, teeth, gum, toothbrush, toothpaste, hygiene, Dentist. Wash, bath, soap.	Fish, reptile, birds, mammals, amphibians, herbivore, carnivore, omnivore, Leg, head, arms, eyes, mouth, ears, nose, skin, taste, touch, smell, hearing, sight.	Survival, water, food, adult, baby, offspring, lamb, puppy, kitten, calf, etc. Exercise, hygiene, Egg-caterpillar-pupa-butterfly Baby, toddler, child, teenager, human. Grow, reproduce,	Movement, muscles, bones, skull, nutrition, skeleton, vitamins, minerals, fat, protein, carbohydrates, fibre, joint, pull, contract, relax, diet, heart, lungs, brain.	Digestive system, mouth, tongue, canine, incisors, molars, pre-molars, oesophagus, transport, stomach, acids, enzymes, small intestine, large intestine, floss, plaque.	Gestation, puberty, foetus, embryo, womb.	Circulatory, heart, blood, vessels, veins, arteries, oxygenated, deoxygenated, valves, exercise, respiration, drugs, alcohol, substance, lifestyle, damage, lungs, liver.

Biology – Evolution and Inheritance

Year 3	Year 6 **Why do offspring look like their birth parents?**
Know in simple terms how **fossils** are formed when things that have lived are trapped within rock. Ask relevant questions and using different types of scientific enquiries to answer them. Use straightforward scientific evidence to answer question or to support their findings.	Know that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. Know how Animals, including humans and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. Know that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. Plan different types of scientific enquiries to answer questions including recognising and controlling variables where necessary. Recording data and results of increasing complexity using scientific diagrams and labels, classification key, tables, scatter graphs, bar and line graphs. Report and present finding from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as display and other presentations. Identify scientific evidence that has been used to support or refute ideas or arguments.
	Fossils, adaptation, evolution, characteristics, reproduction, genetics, identical, traits, natural selection, inheritance. fossil, fossilisation, sediment, scavenger, corpse, erosion, sub-fossils, compressed, minerals, palaeontologist, excavate, environment, habitat, evolution, adaptation, Big Bang, single celled organism, life form, animal, plant.

Chemistry - Materials

EYFS ELG: There are important processes and changes that happen	**Year 1** **Would a house made of plastic and metal be as good as a house made of bricks, wood and glass?**	**Year 2** **Would you use the same materials to make a summer outfit as you would for a winter outfit?**	**Year 4**	**Year 5** **Can all mixtures be separated and how can separating materials be useful?**
Know that temperature can change materials in both reversible and irreversible ways such as melting ice, chocolate or baking bread. Know that there are changes that happen in the natural world. Use their senses and hands on exploration of natural materials and their environment to explore and talk about what they see, hear, smell and touch. Ask questions and investigate why things happen in the classroom and wider environment through adult led and child initiated activities for example creating a	Know the simple physical properties of a variety of everyday materials. Know and name a variety of everyday materials, including wood, metal, plastic, glass, metal, water and rock. Know and be able to group together a variety of everyday materials on the basis of their simple physical properties. Ask questions and recognise that they can be answered in different ways. Observe closely, using simple equipment. Identifying and classifying.	Know and be able to compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. Know how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching). Ask questions and recognise that they can be answered in different ways. Observe and record the uses of materials. Set up a test- to see which materials can	**States of Matter** Know and be able to group materials together, according to whether they are solids, liquids or gases. Know 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), Know the part played by evaporation and condensation in the Water cycle and associate the rate of evaporation with temperature.	**Properties and changes of materials** Know and be able to group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. Know that dissolving, mixing and changes of state are reversible changes. Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating **Give reasons**, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic 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. Plan different types of scientific enquiries to answer questions including recognising and controlling variables where necessary.

volcano experiment that leads to a discussion of the process alongside real life pictures and videos – often linked to the children's own interests.	Gather and record data to help in answering questions. Use their observations and ideas to suggest answers to simple questions.	change shape if they are twisted, bent, squashed, stretched. Use their observations and ideas to suggest answers to questions.		Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Record data and results of increasing complexity using scientific diagrams and labels, classification key, tables, scatter graphs, bar and line graphs. Use test results to make predictions to set up further comparative and fair tests. No final outcome but lots of practical experiments on separating materials, dissolving etc 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 display and other presentations. Identifying scientific evidence that has been used to support or refute ideas or arguments.
	Property, group, resist, melting, particles, material, properties, absorbency, waterproof, strong, weak, Plastic	Ceramic, waterproof, Rubber, Wood, Glass, Paper, Metal, Texture, Soft, Hard, Stretchy, Waterproof Heavy Rigid Bendy Soft Disintegrate		

Chemistry - The Earth : (Rocks, Atmosphere)

Year 3

Where do rocks come from?

Know that that **soils** are made from rocks and organic matter.

Know and be able to describe in simple terms how fossils are formed when things that have lived are trapped within rock.

Know about different kinds of rocks and their simple physical properties.

(new) Classify different kinds of rocks on the basis of their simple physical properties.

Ask relevant questions and using different types of scientific enquiries to answer them.

Set up simple practical enquiries, comparative and fair test.

Make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. Recording findings using simple scientific language, drawings, labelling diagrams, keys, bar charts, and tables.

Use results to draw simple conclusions, make predictions for new values, suggest improvement and raise further questions.

Use straightforward scientific evidence to answer question or to support their findings.

Vocabulary: rock, slate, granite, sandstone, chalk, clay, sand, limestone, texture, absorbent, characteristic, surface, sedimentary, metamorphic, igneous Quartz, marble, pebble.

Physics - Motion and forces:		
Year 2	**Year 3** **How do we know that forces exist if we can't see them?**	**Year 5** **If I drop an object on to a slope why does it roll downwards?** **What could I do to make it roll downwards more slowly?**
Materials: Know that the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. Ask question and recognising that they can be answered in different ways. Observe and recording the uses of materials. Set up a test- to see which materials can change shape if they are twisted, bent, squashed, stretched. Use their observations and ideas to suggest answers to questions	**Forces and Magnets:** Know that some forces need contact between two objects, but magnetic forces can act at a distance. Compare how things move on different surfaces. Set up simple practical enquiries, comparative and fair test. Make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. Gather, record, classify and present data in a variety of ways to help in answering questions. Recording findings using simple scientific language, drawings, labelling diagrams, keys, bar charts, and tables. Use results to draw simple conclusions, make predictions for new values, suggest improvement and raise further questions. Identify differences, similarities or changes related to simple scientific ideas and processes. Use straightforward scientific evidence to answer question or to support their findings.	Know that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. Know the effects of air resistance, water resistance and friction, that act between moving surfaces Recognise that some mechanisms, including gears, pulleys, levers and springs, allow a smaller force to have a greater effect. Plan different types of scientific enquiries to answer questions including recognising and controlling variables where necessary. Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Record data and results of increasing complexity using scientific diagrams and labels, classification key, tables, scatter graphs, bar and line graphs. Use test results to make predictions to set up further comparative and fair tests. Report and present finding from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as display and other presentations. Identify scientific evidence that has been used to support or refute ideas or arguments.

Physics - Light

Year 3 **Do all objects cast a shadow?**	Year 6 **What do we need in order to be able to see an object?** **Why can't we see in the dark?**
Know that light is reflected from surfaces. Know that light from the sun can be dangerous and that there are ways to protect their eyes. Know that they need light in order to see things and that dark is the absence of light. Know that shadows are formed when the light from a light source is blocked by a solid object. Find patterns that determine the size of shadows. Ask relevant questions and using different types of scientific enquiries to answer them. Set up simple practical enquiries, comparative and fair test. Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. Record findings using simple scientific language, drawings, labelling diagrams, keys, bar charts, and tables. Use results to draw simple conclusions, make predictions for new values, suggest improvement and raise further questions. Using straightforward scientific evidence to answer question or to support their findings.	Know that light appears to travel in straight lines. Know that light travels in straight line and use this idea to explain that objects are seen because they give out or reflect light into the eye. Know that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. Know that light travels in straight lines. Explain why shadows have the same shape as the objects that cast them. Plan different types of scientific enquiries to answer questions including recognising and controlling variables where necessary. Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Recording data and results of increasing complexity using scientific diagrams and labels, classification key, tables, scatter graphs, bar and line graphs. Use test results to make predictions to set up further comparative and fair tests. Design glasses based on findings to aide sight. Report and present finding from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as display and other presentations. Identifying scientific evidence that has been used to support or refute ideas or arguments.

Physics – Sound

Year 4

Does sound travel better through a solid, a liquid or a gas?

Know how sounds are made, associating some of them with something vibrating

Know that vibrations from sounds travel through a medium to the ear.

*Know that there are patterns between the pitch of a sound and features of the object that produced it.

*Know that there are patterns between the volume of a sound and the strength of the vibrations that produced it.

Know that sounds get fainter as the distance from the sound source increases

Ask relevant questions and using different types of scientific enquiries to answer them.

Set up simple practical enquiries, comparative and fair test. Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.

Record findings using simple scientific language, drawings, labelling diagrams, keys, bar charts, and tables.

Use results to draw simple conclusions, make predictions for new values, suggest improvement and raise further questions. Using straightforward scientific evidence to answer question or to support their findings.

Physics - Magnetism:
Year 3
Know that some forces need contact between two objects and some forces act at a distance. Know that a variety of everyday materials can be compared and grouped together on the basis of whether they are attracted to a magnet. Know that magnets have two poles.
Predict whether two magnets will attract or repel each other, depending on which poles are facing. Observe how magnets attract or repel each other and attract some materials and not others. Identify some magnetic materials. Ask relevant questions and using different types of scientific enquiries to answer them. Set up simple practical enquiries, comparative and fair test. Make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. Gather, record, classify and present data in a variety of ways to help in answering questions. Record findings using simple scientific language, drawings, labelling diagrams, keys, bar charts, and tables. Use results to draw simple conclusions, make predictions for new values, suggest improvement and raise further questions. Identify differences, similarities or changes related to simple scientific ideas and processes. Use straight forward scientific evidence to answer question or to support their findings

Physics - Electricity

Year 4 **Do all materials conduct electricity?**	**Year 6** **How do different factors affect circuits?**
Know which common appliances run on electricity. Know 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. Know that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. Know some common conductors and insulators, and associate metals with being good conductors. Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. Ask relevant questions and using different types of scientific enquiries to answer them Setting up simple practical enquiries, comparative and fair test. Make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. Record findings using simple scientific language, drawings, labelling diagrams, keys, bar charts, and tables. Use results to draw simple conclusions, make predictions for new values, suggest improvement and raise further questions. Use straightforward scientific evidence to answer question or to support their findings.	Know and be able to use recognised symbols when representing a simple circuit in a diagram. Know and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Record data and results of increasing complexity using scientific diagrams and labels, classification key, tables, scatter graphs, bar and line graphs. Use test results to make predictions to set up further comparative and fair tests. Report and present finding from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as display and other presentations. Identify scientific evidence that has been used to support or refute ideas or arguments

Physics – Earth and Space

EYFS ELG: That there are changes in the natural world through the seasons	Year 1	Year 5 **Why does the sun appear to move across the sky?**
Know that there are four seasons across the year; Know that the seasons affect the temperature; Know that plants and animals react to seasons in the way they grow and their natural life cycles; Know the length of day and night changes depending on the season; Know the vocabulary of the four seasons. Start to use the vocabulary associated with the seasons. Comment on the weather and temperature making simple observations linked to seasonal understanding. Comment on what they see in their local environment such as flowers in bud or leaves falling from trees and make connections, linking it to their seasonal understanding. Comment on characters, settings and events in stories that are linked to seasonal characteristics and changes. Collect and examine evidence of changing seasons talking about what they see.	**Seasonal changes:** Know and describe weather associated with the seasons and how day length varies. Observe changes across the four seasons. Gather and record data to help in answering questions. Use their observations and ideas to suggest answers to questions. Perform simple tests. Observe closely, using simple equipment. Ask simple questions and recognise that they can be answered in different ways.	Know and be able to describe the movement of the Earth and other planets relative to the Sun in the solar system. Know that the Sun, Earth and Moon are approximately spherical bodies Know and be able to describe the movement of the Moon relative to the Earth Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Record data and results of increasing complexity using scientific diagrams and labels, classification key, tables, scatter graphs, bar and line graphs. Identify scientific evidence that has been used to support or refute ideas or arguments Ptolemy, Alhazen and Copernicus.