



Science Progression Document

Aims

The national curriculum for science aims to ensure that all pupils:

- Develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- Develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
- Be equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future

National Curriculum Objective

Key Vocabulary

This list is not exhaustive and may be edited to reflect the age of the pupils

Progression of component skills

This relates to the design and technology skills which pupils should have developed and practised

Nursery

End points

- To explore the natural environment through sensory experiences.
- To explore how things work and explain why things happen.
- Understand the life cycle of a plant and animal.
- Respect and care for the natural environment and living things.

- materials
- animals
- environment
- senses
- seasons
- changes
- growth

See Developing Curriculum Nursery for component skills.

Reception

End points and Early Learning Goals

- To explore the natural world and use their senses to make observations.
- To explore different environments and understand the effects of changing seasons.

- test
- investigation
- experiment
- prediction

See Developing Curriculum Reception for component skills.

- Understand similarities and differences in everyday and scientifically. 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.	- forces - float - sink - Seasons - classify - natural world - observations		
National Curriculum Objective	Key Vocabulary This list is not exhaustive and may be edited to reflect the age of the pupils. Scientific terms and language should be taught throughout all topics	Key Questions The answers to these key questions relate to the essential knowledge which pupils should have acquired by the end of a topic	Working Scientifically This relates to the skills which pupils have developed and practise and consist of what they can plan, do, record and review by the end of a topic
Animals, including Humans			
Y1 Identify and name a variety of common animals including, fish, amphibians, reptiles, birds and mammals	<u>Animal names including:</u> Birds: blackbird, seagull, pigeon Fish: salmon, tuna, mackerel, goldfish Amphibians: Frog, toad, salamander, newt Reptiles: crocodile, turtle, alligator, snake Mammals: mouse, lion, dog, deer, human	- Who’s who in the animal world? - How are animals different? - What is so special about birds? - Why do fish not have fingers?	- Identifying and classifying a range of different animals - Gathering information and recording it - Grouping and ordering different animals - Observing closely and gathering and recording data to help in answering questions

	● Invertebrates: worm, jellyfish, spider, lobster. ● sorting, grouping, features, legs, wings, fur, tail, underwater, air, amphibian, mammal		
Y1 ● Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals ● Identify and name a variety of common animals that are carnivores, herbivores and omnivores ● Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets)	● Suitable, pets, domestic, wild, food, space, shelter, medicine, water, care, responsibility. Pets: dog, cat, fish, rabbit, guinea pig. ● Scientific, describe, description Fish: gills, fins, scales Birds: beaks, wings, claws, feathers ● Include any other specific animals your class are interested in. ● Herbivore, carnivore, omnivore	● Do all animals have a skeleton? ● How do animals' bodies help them to move? ● Why do birds need feathers and fish need scales? ● What is an herbivore, a carnivore and an omnivore? ● What foods do different animals eat?	● Comparing and contrasting different animals using videos, photographs and observations ● Asking simple questions ● Finding things out through using secondary sources of information ● Carrying out simple comparison tests

Y1 Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense	<u>Caring for Our Bodies:</u> exercise, sports, healthy, fit, heart, sweat, clean, soap, bath, fruit, meat, vegetables, protein, fat, sugar, carbohydrate, vitamins, nutrients <u>Our Bodies</u> <u>Sight:</u> eye, iris, eyelid, eyelash, pupil, vision, reflection, glasses, contact lenses, telescope, microscope, blindness. <u>Hearing:</u> ear, eardrum, deaf, hearing aid, vibration, sound wave, speaker, radio, stereo, microphone.	- How do I look after my body and keep it healthy? - What are your senses and how do they help you?	- Learning the names of different parts of the body and label diagrams - Asking questions about the arts of the body - Performing simple tests and activities relating to the senses
Y2 - Find out about and describe the basic needs of animals including humans for survival (water, food and air) - Understand that animals, including humans, have offspring which grow into adults.	- Survival, water, food, air - Animal, Baby, Offspring, Egg, Birth, Reproduction, Changes	- What do all living creatures need to stay alive? - How do the bodies of animals change as they grow? - Do all animals grow and live the same way?	- Observing using videos different animals and what they eat - Grouping and classifying the different animals according to their diet - Asking simple questions - Gathering and recording data and ideas to suggest answers to questions - Finding things out through using secondary sources of information
Y2 Describe the importance for humans of exercise, eating the right amounts of different types of food and hygiene	Exercise, nutrition, hygiene, growth, balanced diet. Fruit, vegetables,	- Why do humans need to exercise? - What food should humans eat to stay healthy?	- Experiments about how germs can spread - Finding things out using secondary sources of information - Gathering and recording data to answer questions - Noticing patterns - Grouping and classifying

Y3 ● Identify that animals, including humans, need the right types and amount of nutrition, and that if they cannot make their own food; they get nutrition from what they eat. ● Identify that humans and some other animals have skeletons and muscles for support, protection and movement	● Nutrients, nutrition, carbohydrates, protein, fats, vitamins, minerals, water, fibre, ● skeleton, bones, joints, endoskeleton, exoskeleton, hydrostatic skeleton, vertebrates, invertebrates, muscles, contract, relax,	● What would happen if animals did not eat? ● What needs to be included in the best diet for humans? ● Why do we need a skeleton? ● Are bones that are bigger, stronger? ● How do different animals move?	● Asking relevant questions and using different types of scientific enquiries to answer them ● Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions ● Reporting on findings from secondary sources ● Identifying and grouping animals with and without skeletons and compare their movement ● Identifying differences, similarities or changes related to simple scientific ideas and processes
Y4 ● Construct and interpret a variety of food chains, identifying producers, predators and prey.	● Food chain, predator, prey, producers, species, environment, organisms, habitat and prey.	● What food chains and webs are there in our local habitat? ● How does energy move through the food chain? ● How does removal of one species from an environment, affect others? ● How does environmental change affect different organisms?	● Asking relevant questions and use different types of scientific enquiries to answer them ● Making systematic and careful observations ● Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions ● Reporting on findings from secondary sources ● Using results to draw simple conclusions.
Y4 ● Describe the simple functions of the basic parts of the digestive system in humans. ● Identify the different types of teeth in humans and their simple functions.	● Digestive, mouth, tongue, teeth, salivary glands, oesophagus, stomach, duodenum, small intestine, large intestine, gall bladder, pancreas, liver, rectum, anus ● Canine, molar, incisor, pre molar, wisdom,	● What is the journey of food through our bodies? ● What different types of teeth do we have and what are their functions? ● What are producers, predators and prey and how do they impact on each other?	● Putting objects such as egg shells into coke or other acids and recording the impact ● Asking relevant questions and using different types of scientific enquiries to answer them ● Setting up simple practical enquiries, comparative and fair tests ● Making systematic and careful observations

Construct and interpret a variety of food chains identifying producers, predators and prey	Food chain producer, predator, prey		Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
Y5: Describe the changes as humans develop to old age	Mammals, Gestation - period, Viviparous, Zygote, Embryo, Foetus Milestones, Birth to 2 years, 2 to 3 years, 3 to 5 years, 5 to 7 years, 7 to 10 years, 10 to 12 years Aging, old age, elderly, adult, causal relationship, growth, change, death Reaction, Age, Effect, Slower, Quicker	- Why do all animal embryos not look the same? - What are the key milestones in a human's life? - What changes happen to humans as they grow older?	- Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs - Reporting and presenting 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 - Identifying scientific evidence that has been used to support or refute ideas or arguments
Y5 (Living things and their habitats) Describe the changes as humans develop to old age	Human life cycle, 6 stages, Foetus, Baby, Child, Teenager, Puberty, Adult, Elderly	- What is a life cycle? - How do gestation periods differ between animals and humans? - What causes puberty? - What changes do we go through during puberty?	- Reporting and presenting 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 - Identifying scientific evidence that has been used to support or refute ideas or arguments
Y6: Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.	Heart, pulmonary, arteries, veins, atrium, ventricle, valves, oxygenated and deoxygenate-d blood, circulatory system, double circulation,	- What are the names and functions of the organs of the human circulatory system? - Describe how oxygen circulates around our bodies	- Researching the relationship between diet, lifestyle, exercise and help - Planning different types of scientific enquiries to answer their own or others' questions, including

● Describe the ways in which nutrients and water are transported within animals, including humans ● Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function	oxygen, carbon dioxide, respiration, Lungs, heart, pulmonary vein ● Arteries, veins, capillaries, carbon dioxide, oxygen, blood supply, pulse, health risks, exercise, healthy eating. ● Diet, exercise, lifestyle, drugs, alcohol, smoking	● How are nutrients and water transported around our bodies? ● What impact does our diet, fitness and lifestyle have on our bodies?	recognising and controlling variables where necessary ● Recording data and results of increasing complexity ● Reporting and presenting 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
Y6 (Evolution and inheritance) ● Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. ● Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. ● Identify how animals and plants are adapted to suit their environment in different ways and that	● Offspring, species, creation, genus, variation, evolution ● Fossils, offspring vary, extinct, adaptation and evolution	● Who was Charles Darwin? ● What is evolution and what evidence is there to support the theory of evolution? ● What are fossils and what do they tell us? ● How and why do animals and plants adapt to suit their environment? ● For what reasons do animals become extinct? ● What is an inherited characteristic? What is variation? ● What impact have humans had on plants and animals in the past? ● What impact will humans have on earth in the future?	● Observing local animals and how they adapt to their environment ● Comparing how animals and plants can adapt to live in different environments e.g. polar bears, camels, penguin, cacti ● Analysing the impact of adaptations such as long and short beak ● Recording data and results of increasing complexity ● Reporting and presenting 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 (Year 6 focus) ● Describing and evaluating their own and other people's scientific ideas related to topics in the national curriculum (including ideas that have changed over time), using evidence from a range of sources ● Grouping and classifying things and recognising patterns

adaptation may lead to evolution			
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Living things and their habitats

National Curriculum Objective	Key Vocabulary This list is not exhaustive and may be edited to reflect the age of the pupils	Key Questions The answers to these key questions relate to the essential knowledge which pupils should have acquired by the end of a topic	Working Scientifically This relates to the skills which pupils have developed and practise and consist of what they can plan, do, record and review by the end of a topic
Y2 - Explore and compare the differences between things that are living and dead and things which have never been alive - 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. - Identify and name a variety of plants and animals in their habitats, including microhabitats.	- Living , dead, growth, decay - Habitat, research, conditions, ocean, tropical rainforest, arctic, desert, adaptation. - Micro-habitats, light, dark, shady, damp, dry, seasons, sun. - Food chain, consumer, producer, predator, prey, herbivore, carnivore, omnivore. - habitats, food chain, energy, transfer, predators	- Has everything been alive? - Why do things die - How do animals and plants 'adapt' to live in their habitats? - What is a microhabitat? - What animals live in our school environment? - How do their habitats change over our school year? - What is a food chain? - Do all animals eat the same thing?	- Finding things out using secondary sources of information - Noticing patterns - Sorting and classifying things that are alive, dead or have never been alive - Recording findings using charts and tables - Grouping and classifying - Gathering and recording data to answer questions - Creating habitats for insects

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.			
Y4 - Recognise that living things can be grouped in a variety of ways. - Recognise that environments can change and that this can sometimes pose dangers to living things. - Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.	- Environment, change, living thing, danger. - Change, adapt, danger, threat. - Classification, habitat, human impact, migrate, hibernate	- How does environmental change affect different organism - How does human activity affect our environment? - In what ways can we group and classify living things? - What living things can be found in the local environment?	- Asking relevant questions and using different types of scientific enquiries to answer them - Making systematic and careful observations of the local environment to identify and classify plants and animals - 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
Y5 - Describe the differences in the life cycles of a mammal, an amphibian, a bird and an insect. - Describe the life process of reproduction in	Adaptation, special features, environments, sexual reproduction, life cycle, environment, asexual reproduction	- What are the different types of reproduction in plants and animals? - What are the key features of life cycles for plants and animals?	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary

some plants and animals.			
Y6 - 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. - Give reasons for classifying plants and animals based on specific characteristics.	- Classification, characteristics, variation, organisms, populations, microorganisms, amphibians, reptiles, mammals, invertebrates, vertebrates. - Kingdom: Animalia Phylum: Chordata Class: Mammalia Order: Primates Family: Hominidae Genus: Homo Species: Homo sapiens - Carl Linnaeus	- How and why do we classify living things? - What are the difficulties with classification? (penguins, whales, platypus) - What are micro-organisms and why are they important?	- Reporting and presenting 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 (Year 6 focus) - Describing and evaluating their own and other people's scientific ideas related to topics in the national curriculum (including ideas that have changed over time), using evidence from a range of sources - Grouping and classifying things and recognising patterns

Materials

National Curriculum Objective	Key Vocabulary This list is not exhaustive and may be edited to reflect the age of the pupils	Key Questions The answers to these key questions relate to the essential knowledge which pupils should have acquired by the end of a topic	Working Scientifically This relates to the skills which pupils have developed and practise and consist of what they can plan, do, record and review by the end of a topic
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Y1 (everyday materials) ● Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. ● Distinguish between an object and the material from which it is made. ● Describe the simple physical properties of a variety of everyday materials ● Compare and group together a variety of everyday materials on the basis of simple physical properties	● Wood, plastic, glass, metal, water, rock, material, difference ● Recycle ● Marine / ocean	● What are materials and how are they different? ● Why does it matter what things are made of?	● Ask simple questions and recognise that they can be answered in different ways ● Sort and classify different materials ● Perform simple tests on different materials ● Use his/her observations and ideas to suggest answers to questions about different materials ● Gather and record data to help in answering questions
Y2 Uses of everyday materials ● 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	● Material, Properties, Design, Strong, Malleable, Waterproof, Tough.	● Why do objects have to be made from different materials? ● How can you change and alter different materials? ● What is plastic pollution? ● How can it affect our world? ● How can we reduce the amount of plastic we use/	● Compare the use of different materials in and around the school, at home, outside ● Classify these different materials ● Carry out experiments using different materials for the same purpose e.g. cups made of paper

be changed by squashing, bending, twisting and stretching			
Y3 Rocks • 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.	• Rocks, igneous, metamorphic, sedimentary, anthropic, permeable, impermeable • Chemical fossil, body fossil, trace fossil, Mary Anning, cast fossil, mould fossil, replacement fossil, extinct, palaeontology • Organic matter, top soil, sub soil, base rock.	• What types of rocks are there and how do they change over time? • How are rocks formed? • How are fossils created and what do fossils tell us about how things change and develop? • Who was Mary Anning and what was her impact on palaeontology? • What is soil and how does it change in different places?	• Observe rocks used in buildings and gravestones and how they change over time • Research and discuss the different kinds of living things whose fossils are found • Explore different types of soil and the similarities and difference between them • Set up simple practical enquiries, comparative and fair tests • Gather, record, classify and present data in a variety of ways to help in answering questions • Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
Y4 States of matter • 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	• Solid, liquid, gas, particles, state, material, properties, carbon dioxide, matter, weight, mass, • Melt, freeze, thermometer, temperature, condense	• What is a state of matter and how does the state of matter affect the material? • What effect do different temperatures have on some materials?	• Explore the effect of temperature on different substances • Make food through melting such as crispy cakes, • Research the temperature at which different materials change e.g. iron • Record observations of water evaporating e. putting

measure or research the temperature at which this happens in degrees Celsius. .	• Climate change, environment, fossil fuel, recycling, plastic life cycle, global warming	• What happened when you heat or cool some materials? • Which substances do not fit into one state of matter? • What happens when fuels are burnt? • What are the properties of glass, ceramics and plastics and how are they made? • Why is recycling important? • What is the life cycle assessment? (plastic life cycle) • What is global warming? What is climate change?	a wet object on the window sill and a similar one in a dark place and record the effects • Group and classify a variety of different materials • Explore the effect of temperature on substances such as chocolate, ice cream crisps • Take temperature readings and research the temperature • Observe and record evaporation and melting
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Y5 Properties and changes of materials: ● 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 ● Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution ● 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 ● Demonstrate that dissolving, mixing and changes of state	● Hardness, Solubility, Transparency, Conductivity, Magnetic, Filter, Evaporation, Dissolving, Mixing Material, conductor, dissolve, insoluble, suspension, chemical, physical, irreversible, solution, reversable, separate, mixture, insulator, transparent, flexible, permeable, soluble, property, magnetic, hard. ● Insulator, thermal, electrical, magnets ● Chemical reaction, carbon dioxide gas, volume, reactant, Product ● Filtering, sieving	● How can we group everyday materials? ● What is the difference between a reversible and irreversible change? ● What are the different ways of separating materials? ● How does chemical change impact on our everyday life?	● 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 keys, tables, scatter graphs, bar and line ● 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 displays and other presentations ● Identify scientific evidence that has been used to support or refute ideas or arguments
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are reversible changes ● 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.			
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Plants

National Curriculum Objective	Key Vocabulary This list is not exhaustive and may be edited to reflect the age of the pupils	Key Questions The answers to these key questions relate to the essential knowledge which pupils should have acquired by the end of a topic	Working scientifically This relates to the skills which pupils have developed and practise and consist of what they can plan, do, record and review by the end of a topic
Y1 Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.	- Petals, stem, leaf, bulb, flower, seed, stem, root, deciduous, evergreen, trunk, branch, root, tree and plant names. - Wild, weed, common.	- Are all plants green? - Do all trees have leaves all year round? - Who was Wangari Maathai? - How did she promote peace?	- Observe and draw a range of flowers, plants and trees - Gather and observe a range of plants and make charts of their features - Ask simple questions and recognise that they can be answered in different ways
Y1 Identify and describe the basic structure of a variety of common flowering plants, including trees	Flower, petal, leaves, stem, roots, seeds, bulb, branch, tree trunk, bark	- What is the structure of a plant? - What is the structure of a tree? - Why do plants have flowers?	- Label the different parts of trees, plants and flowers - Sort flowers into wild and garden plants - Ask simple questions and recognise that they can be answered in different ways
Y2 - Observe and describe how seeds and bulbs grow into mature plants. - Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	Changes, Growth, Shoot, Roots, Bean, Sprout, Living, Darkness, Water, Oxygen	- What is the journey of a seed to plant? - What do plants need to grow and stay healthy?	- Observe and record the growth of a variety of plants - Comparative tests to show how plants grow differently according to conditions - Ask simple questions and recognise that they can be answered in different ways including use of scientific language from the national curriculum - Perform simple comparative tests - Identify, group and classify

			● Use his/her observations and ideas to suggest answers to questions
Y3 ● Explore 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. ● Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. ● Investigate the way in which water is transported within plants. ● Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	● Plants, Survive, Food, Water, Oxygen, Sunlight ● Function of parts, water transportation, pollination, seed formation, dispersal, plants and environment.	● What do plants need to grow well and how do the requirements change for different types of plants? ● How do plants make their food? ● How does light affect plant growth? ● What are the main parts of a plants including flowers and trees and what are their functions? ● How and why does water move through plants? ● How do plants reproduce? ● How do insects know which flowers to pollinate?	● Grow plants using dye in the water ● Ask relevant questions and use different types of scientific enquiries to answer them ● Make systematic and careful observations and, where appropriate, take accurate measurements ● Gather, record, classify and present data in a variety of ways to help in answering questions ● Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables ● Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions ● Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions ● Identify differences, similarities or changes related to simple scientific ideas and processes ● Use straightforward scientific evidence to answer questions or to support his/her findings

Sound

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Y4 Sound - 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.	sound, listen, hear, ears, noise, loud, quiet, silent, vibrations, transmit, medium, air, water, solid, source, sound waves, particles, travel, volume, loudness, amplitude, pitch, soundwave, frequency, sign language	- How is sound made? - Does sound travel differently in a variety of conditions? - How do we change the pitch and the volume of a sound?	- Ask relevant questions and use different types of scientific enquiries to answer them - 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 - Gather, record, classify and present data in a variety of ways to help in answering questions - Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables - Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions

Light

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Y3 Light - Recognise that they need light in order to see things and that dark is the absence of light. - Notice that light is reflected from surfaces. - Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. - Recognise that shadows are formed when the light from a light source is blocked by a solid object. - Find patterns in the way that the sizes of shadows change.	Light source, dark, reflect, ray, mirror, bounce, visible, beam, sun, glare, travel, straight, opaque, shadow, block, transparent, translucent.	- How does the colour of a material affect how reflective it is? - How does the thickness, the translucence and the transparency of a material affect how much light can pass through it? - How can we change the darkness, size and shape of a shadow? - How does the sun's light impact on humans?	- Test the size of shadows at different times of the day - Experiments with different types of materials and shining a torch - Experiments with sunglasses - Independent research on facts about the sun or other related topics - Ask relevant questions and use different types of scientific enquiries to answer them - 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 - Gather, record, classify and present data in a variety of ways to help in answering questions
Y6 - Recognise that light appears to travel in straight lines. - Use the idea that light travels in straight lines to explain that objects are seen because they give	Light source, dark, reflect, ray, mirror, bounce, visible, beam, sun, glare, travel, straight, opaque, shadow, block, transparent,	- Does light travel in straight lines? - Why do shadows have the same shape as the object that casts them? - How does a periscope/microscope/telescope work?	- Ask relevant questions and use different types of scientific enquiries to answer them - Set up simple practical enquiries, comparative and fair tests - Make systematic and careful observations and, where appropriate, take accurate

out or reflect light into the eye. ● Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. ● Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. ● Know how simple optical instruments work, e.g. periscope, telescope, binoculars, mirror, magnifying glass etc.	translucent. Reflect Absorb Emitted Scattered Refraction		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, labelled diagrams, keys, bar charts, and tables ● Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions ● Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions ● Identify differences, similarities or changes related to simple scientific ideas and processes Use straightforward scientific evidence to answer questions or to support his/her findings
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Seasonal Changes/Earth and Space

National Curriculum Objective	Key Vocabulary This list is not exhaustive and may be edited to reflect the age of the pupils	Key Questions The answers to these key questions relate to the essential knowledge which pupils should have acquired by the end of a topic	Working scientifically This relates to the skills which pupils have developed and practise and consist of what they can plan, do, record and review by the end of a topic
Y1 - Observe changes across the 4 seasons. - Observe and describe weather associated with the seasons and how day length varies	- Seasons, autumn, winter, spring, summer, month, weather, event. - Observe, observations, data, record, weather, symbol, temperature, rainfall, wind direction, thermometer, rain gauge, weather vane	- What is a season and how many are there? - How do the seasons usually affect the weather? - What do we know about the weather? - How does the weather change across the seasons? - What impact do the seasons have on trees and how do they change? - How do we measure rainfall? - What is hibernation? Which animals hibernate and why? - What is wind and wind direction?	- Making charts and tables about the weather - Making displays of what happens in the world around them as the seasons change Ask simple questions and recognise that they can be answered in different ways - Gather and record data to help in answering questions
Y5 - Describe the movement of the Earth and other planets relative to the sun in the solar system. - Describe the movement of the moon relative to the Earth. - Describe the sun, Earth and moon as approximately spherical bodies. - Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.	Earth, Sun, Moon, Axis, Rotation, Day, Night, Phases of the Moon, star, constellation, waxing, waning, crescent, gibbous. Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, planets, solar system, day, night, rotate, orbit, axis, spherical, geocentric, heliocentric.	- How does the sun's gravitational pull affect the earth and other planets in our solar system? - Why does the moon orbit the earth? - What are the planets and where are they in our solar system? - What do we know about the planets in our solar system? - What is important about the placement of the earth and other planets in relation to the sun? - What is night and day? How does the earth's rotation impact on night and day?	- Models of the solar system - Visit to a planetarium or Jodrell bank - 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 keys, tables, scatter graphs, bar and line - Use test results to make predictions to set up further comparative and fair tests

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Forces

National Curriculum Objective	Key Vocabulary This list is not exhaustive and may be edited to reflect the age of the pupils	Key Questions The answers to these key questions relate to the essential knowledge which pupils should have acquired by the end of a topic	Working scientifically This relates to the skills which pupils have developed and practise and consist of what they can plan, do, record and review by the end of a topic
Y3 Forces and magnets • Compare how things move on different surfaces. • Notice that some forces need contact between 2 objects, but magnetic forces can act at a distance. • Observe how magnets attract or repel each other and attract some materials and not others. • Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. • Describe magnets as having 2 poles. • Predict whether 2 magnets will attract or repel each other, depending on which poles are facing.	• Force, push, pull, friction, surface, magnet, magnetic, magnetic field, pole, north, south, attract, repel, compass	• What are magnetic materials? • How can we find out if a material is magnetic? • Can I make a magnetic material non-magnetic? • What is magnetic attraction? • What is magnetic repulsion?	• Classify and record materials as magnetic and non-magnetic • Compare and record how different things move on different materials and surfaces • Carry out simple experiments using magnets • Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • Use straightforward scientific evidence to answer questions or to support his/her findings
Y5 Forces • Explain that unsupported objects fall towards the		• What is a force and how do forces impact on our lives?	• Explore falling objects using different parachutes and a range of variable

Earth because of the force of gravity acting between the Earth and the falling object. ● Identify the effects of air resistance, water resistance and friction that act between moving surfaces. ● Recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect	● Variables, support, fall, Earth, gravity, air resistance, friction, moving surfaces Variables, accuracy, precision, gravity, friction, moving surfaces, mechanisms, gears, transfers Variables, accuracy, causal relationships, support/refute, fall, gravity, water resistance ● Variables, accuracy, precision, causal relationships, gravity, mechanisms, levers, pulleys, transfers	● What is resistance and how does it impact on objects? ● What is friction and how does it impact on a moving object? ● What is the most effective way to move an object? ● What is the difference between a pulley, a lever and a gear?	● Explore resistance in water by making and testing a variety of boats ● 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 keys, tables, scatter graphs, bar and line ● 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 displays and other presentations ● Identify scientific evidence that has been used to support or refute ideas or arguments
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Electricity

National Curriculum Objective	Key Vocabulary This list is not exhaustive and may be edited to reflect the age of the pupils	Key Questions The answers to these key questions relate to the essential knowledge which pupils should have acquired by the end of a topic	Working scientifically
Y4 - Identify common appliances which 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.	- electricity, circuit, switch, battery, plug, mains, appliance, device, wire, crocodile clip, bulb, buzzer, connection, power, cell - energy, flow, current - conductor, insulator	- What is an electrical circuit? - What are the key features of an electrical circuit? - What materials can carry electricity? (conductors/insulators)	- Create simple electrical circuits with different components and different variables - Draw a pictorial representation of the circuit - Ask relevant questions and use different types of scientific enquiries to answer them - 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 - Gather, record, classify and present data in a variety of ways to help in answering questions
Y6 - Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. - Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of	Range of simple electric circuit components – range of bulbs with different voltages, bulb holders, variety of cells of different voltages, battery holders, switches, motors, buzzers, crocodile clips, wires, etc.	- How does the voltage of a battery affect how much current is pushed? - How does the type of circuit affect how the components work and how long the battery lasts? - What are the key symbols used in a circuit diagram?	- Plan different types of scientific enquiries to answer their own or others' 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

buzzers and the on/off position of switches. ● Use recognised symbols when representing a simple circuit in a diagram			● 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 displays and other presentations ● Describe and evaluate their own and other people's scientific ideas related to topics in the national curriculum (including ideas that have changed over time), using evidence from a range of sources
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Year 1 – Working Scientifically

National Curriculum Objectives

- Ask simple questions and recognise that they can be answered in different ways (Year 1 focus)
- Use simple equipment to observe closely (Year 1 focus)
- Perform simple tests (Year 1 focus)
- Identify and classify (Year 1 focus)
- Use his/her observations and ideas to suggest answers to questions (Year 1 focus)
- Gather and record data to help in answering questions (Year 1 focus)

Year 2 – Working Scientifically

National Curriculum Objectives

- Ask simple questions and recognise that they can be answered in different ways including use of scientific language from the national curriculum (Year 2 focus)
- Use simple equipment to observe closely including changes over time (Year 2 focus)
- Perform simple comparative tests (Year 2 focus)
- Identify, group and classify (Year 2 focus)
- Use his/her observations and ideas to suggest answers to questions noticing similarities, differences and patterns (Year 2 focus)
- Gather and record data to help in answering questions including from secondary sources of information (Year 2 focus)

Year 3 – Working Scientifically

National Curriculum Objectives

- Ask relevant questions and use different types of scientific enquiries to answer them (Year 3 focus)
- Set up simple practical enquiries, comparative and fair tests (Year 3 focus)
- Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers (Year 3 focus)
- Gather, record, classify and present data in a variety of ways to help in answering questions (Year 3 focus)
- Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables (Year 3 focus)
- Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions (Year 3 focus)
- Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions (Year 3 focus)
- Identify differences, similarities or changes related to simple scientific ideas and processes (Year 3 focus)
- Use straightforward scientific evidence to answer questions or to support his/her findings (Year 3 focus)

Year 4 – Working Scientifically

National Curriculum Objectives

- Ask relevant questions and use different types of scientific enquiries to answer them (Year 4 focus)
- Set up simple practical enquiries, comparative and fair tests (Year 4 focus)

- Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers (Year 4 focus)
- Gather, record, classify and present data in a variety of ways to help in answering questions (Year 4 focus)
- Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables (Year 4 focus)
- Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions (Year 4 focus)
- Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions (Year 4 focus)
- Identify differences, similarities or changes related to simple scientific ideas and processes (Year 4 focus)
- Use straightforward scientific evidence to answer questions or to support his/her findings (Year 4 focus)

Year 5 – Working Scientifically

National Curriculum Objectives

- Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary (Year 5 focus)
- Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate (Year 5 focus)
- Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs (Year 5 focus)
- Use test results to make predictions to set up further comparative and fair tests (Year 5 focus)
- 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 (Year 5 focus)
- Identify scientific evidence that has been used to support or refute ideas or arguments (Year 5 focus)

Year 6 – Working Scientifically

National Curriculum Objectives

- Plan different types of scientific enquiries to answer their own or others' questions, including recognising and controlling variables where necessary (Year 6 focus)
- Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate (Year 6 focus)
- Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs (Year 6 focus)
- Use test results to make predictions to set up further comparative and fair tests (Year 6 focus)
- 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 (Year 6 focus)
- 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 (Year 6 focus)
- Describe and evaluate their own and other people's scientific ideas related to topics in the national curriculum (including ideas that have changed over time), using evidence from a range of sources
- Group and classify things and recognise patterns

