Annesley Primary & Nursery School Progression Map

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Science

At Annesley Primary and Nursery School, our vision is to develop *little scientists* through nurturing curious, knowledgeable and confident learners who develop a positive attitude towards science and a lifelong fascination with the world around them. Through an ambitious, inclusive and coherently sequenced curriculum, we seek to ensure that every pupil develops the scientific knowledge, skills and understanding needed to make sense of the natural world and recognise the importance of science in everyday life.

Through regular, purposeful teaching and engaging learning experiences, pupils are encouraged to ask questions, explore scientific phenomena and develop explanations for what they observe. Working scientifically is woven throughout our curriculum, giving pupils opportunities to observe, classify, investigate, predict, test ideas, collect and interpret evidence, draw conclusions and evaluate their findings. As pupils progress through the school, they become increasingly independent in selecting appropriate methods of enquiry, making accurate observations and measurements, and using evidence to explain their thinking.

By the end of Year 6, pupils leave Annesley Primary and Nursery School being able to participate meaningfully, develop confidence and experience success as a scientist. By fostering curiosity, resilience, collaboration and independence, we aim to equip children with the knowledge and skills to engage thoughtfully with scientific ideas, appreciate the contribution of science to society and make informed decisions throughout their lives.

Our ARCHIE framework embeds six core values across our curriculum – Ambition, Resilience, Confidence, Honesty, Independence, and Equality. Below are how these values apply to Science at Annesley Primary & Nursery School:

A	Pupils aim high and think deeply about the world around them, aspiring to understand the natural and physical phenomena that shape our universe. They demonstrate ambition by engaging with challenging scientific concepts and vocabulary from an early age, pushing beyond surface-level understanding to explore the 'why' and 'how' of scientific principles. Children are encouraged to ask ambitious questions that drive genuine enquiry, make bold predictions based on their developing knowledge, and articulate their scientific thinking with increasing sophistication. Through exposure to ambitious scientific ideas, pupils develop intellectual curiosity. High expectations are maintained for all pupils, ensuring that everyone is challenged appropriately and supported to achieve success in science, regardless of their starting point.
R	Children demonstrate resilience through the inherent challenges of scientific enquiry, which often involves trial, error, and systematic problem-solving. Pupils learn to persevere when investigations don't go as planned, understanding that unexpected results are not failures but opportunities to refine thinking and deepen understanding. This resilience enables them to embrace the iterative nature of science, recognizing that scientific understanding develops gradually through careful observation, persistent questioning, and the willingness to learn from mistakes.
C	Pupils develop confidence through regular opportunities to share ideas, ask questions, and explain their observations. Through practical investigations and structured discussion, children build the self-assurance needed to articulate their scientific thinking, use technical vocabulary accurately, and defend their conclusions with evidence. This confidence extends to hands-on scientific work, as pupils learn to handle equipment safely, make precise measurements, and trust their own observational skills. By valuing every contribution and creating an environment where scientific dialogue is encouraged, we ensure that all pupils develop the confidence to see themselves as capable scientists who can make meaningful observations and contribute to collective understanding.
H	Honesty is central to working scientifically and forms the foundation of reliable scientific enquiry. Pupils are taught to observe carefully and record results truthfully, even when outcomes differ from their predictions or expectations. They learn to evaluate evidence fairly, acknowledging when data doesn't support their initial hypotheses and being willing to revise their thinking in light of new information. By understanding that scientists must be honest about their findings – particularly when results are surprising or challenge existing understanding – pupils develop the integrity that underpins all credible scientific work. This honest approach to science builds authentic understanding and prepares children to engage with scientific evidence thoughtfully throughout their lives.
I	Pupils are encouraged to take increasing ownership of their scientific learning, developing the autonomy needed to think and work like scientists. They are supported to make informed choices about investigation methods, select appropriate equipment, and determine the most effective ways to record and present their findings. Children develop independence in planning simple investigations, identifying variables, and deciding what to measure or observe. As pupils progress, they become increasingly capable of evaluating their own work, identifying areas for improvement, and extending their learning through independent research and exploration. By fostering this scientific independence, we empower children to become self-directed learners who can investigate questions that interest them and continue their scientific education beyond the classroom.
E	All pupils have equal access to high-quality science teaching, practical experiences, and ambitious scientific knowledge. Every child is provided with the resources, support, and opportunities they need to participate fully in scientific learning, regardless of background, prior attainment, or additional needs. Our science curriculum is inclusive and adaptive, with lessons carefully designed to ensure that all pupils can access core concepts while being appropriately challenged. We actively promote diversity in science by celebrating scientists from all backgrounds and ensuring that children see science as a field open to everyone. By removing barriers to participation and maintaining equally high expectations for all pupils, we create a learning environment where every child can see themselves as a scientist and experience success. This commitment to equality ensures that all pupils develop the scientific knowledge and skills they need to understand the world and make informed decisions as citizens.

		EYFS	Key Stage 1		Key Stage 2			
		Nursery/ Reception	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Working Scientifically	**Knowledge**	• Scientists use their senses to find out about the world. • Things around us change, e.g. ice melts and seasons change. • We can ask questions and talk about what we notice. **Key vocabulary:** look, listen, feel, smell, change, same, different, why, because	• Scientists ask questions and observe closely. • Questions can be answered in different ways, e.g. by looking, testing or asking someone. • Simple equipment, such as hand lenses, rulers and egg timers, helps us observe and measure. **Key vocabulary:** question, observe, test, sort, group, compare, hand lens, record	• Enquiries can be answered by observing changes over time, sorting and grouping, comparing, or using books and the internet. • A test is fair when only one thing is changed. • Results can be recorded in simple tables, tally charts and pictograms. **Key vocabulary:** enquiry, identify, classify, fair, prediction, data, pattern, evidence	• Scientists use different types of enquiry: observing over time, pattern seeking, classifying, fair testing and research. • In a fair test, one variable is changed and the others are kept the same. • Measurements should be made in standard units (e.g. cm, °C, seconds). • Results can be shown in tables, bar charts, labelled diagrams and keys. **Key vocabulary:** fair test, variable, measure, prediction, conclusion, table, bar chart, key	• Repeating measurements makes results more reliable. • Different equipment suits different measurements, e.g. thermometers and data loggers. • Results can be used to draw conclusions and to make predictions for new values. • Scientific enquiries can raise new questions as well as answer them. **Key vocabulary:** repeat, reliable, data logger, thermometer, accurate, predict, improve	• Variables can be changed, measured or controlled; a fair test controls all but one variable. • Accuracy and precision improve when measurements are repeated and equipment is chosen carefully. • Line graphs, bar graphs and scatter graphs show patterns and relationships in data. • Scientific ideas develop over time as new evidence is found, e.g. the models of the solar system. **Key vocabulary:** variable, control, dependent, independent, accuracy, precision, line graph, scatter graph	• Conclusions should explain causal relationships (what caused what) and be supported by the data. • Results can be unexpected or anomalous; scientists decide how far to trust results. • Evidence can support or refute an idea; fact and opinion must be separated. • Secondary sources are used when a question cannot be answered by testing. **Key vocabulary:** causal relationship, anomalous result, evidence, refute, degree of trust, reliable, valid
	Skills	• Explore the natural and made world through self-initiated and adult-led discovery. • Talk about what they see, hear and feel using a wide vocabulary. • Make simple observations and	• Ask simple questions and recognise that they can be answered in different ways. • Observe closely using their senses and simple equipment.	• Ask their own questions and think about how to find evidence. • Make observations and comparisons using simple equipment; suggest what might happen.	• Ask relevant questions and choose a type of enquiry to answer them. • With help, plan and carry out a fair test. • Make systematic and careful observations and	• Suggest questions that can be tested and put forward ideas and predictions. • Set up and carry out fair tests, recognising and explaining why they are fair.	• Plan different types of enquiry, recognising and controlling variables. • Choose equipment and take measurements with increasing accuracy,	• Plan the most appropriate enquiry independently and justify their choices. • Select and use equipment accurately and decide how many repeat readings are needed.

		say what has changed. • Ask questions, e.g. why and how.	• Perform simple tests and identify, sort and classify. • Use observations and ideas to suggest answers, and begin to record in simple ways.	• Carry out simple tests and discuss whether they are fair. • Identify and classify, e.g. using Venn and Carroll diagrams. • Gather and record data in tally charts and tables, and use books and electronic media to find things out.	take measurements in standard units. • Record findings using tables, bar charts, labelled diagrams and simple keys. • Make predictions and use results to draw simple conclusions.	• Use thermometers and data loggers and repeat measurements where appropriate. • Present data in tables, bar charts and keys. • Report findings orally and in writing, suggest improvements and raise further questions.	repeating readings. • Record data using scientific diagrams, tables, bar graphs and line graphs. • Use results to make predictions and plan further tests. • Report conclusions, explanations and how much they trust the results.	• Record complex data in scatter graphs, line graphs, tables and classification keys. • Identify patterns, anomalous results and causal relationships, and explain how far results can be trusted. • Use evidence to support or refute ideas and present findings to different audiences.
		EYFS	**Key Stage 1**		**Key Stage 2**			
		Nursery/ Reception	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Plants	**Knowledge**	• Plants grow from seeds and bulbs. • Plants need water and sun to grow. • Plants have parts: roots, stem, leaves and flowers. • Plants change through the seasons.	• Common wild and garden plants can be identified and named. • Deciduous trees lose their leaves in autumn; evergreen trees keep their leaves all year. • Plants have a basic structure: leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches and stem.	• Seeds and bulbs grow into mature plants. • Plants need water, light and a suitable temperature to grow and stay healthy. • Seeds and bulbs need water to grow, but most do not need light because they contain a store of food.	• Roots anchor the plant and take in water and nutrients; the stem supports the plant and carries water; leaves and flowers have their own jobs. • Plants need air, light, water, nutrients from the soil and room to grow, and these needs vary between plants. • Water is transported through the plant from the roots to the leaves and flowers. • Flowers are involved in the life cycle through pollination, seed formation and seed dispersal.	• Revisit: the parts of a plant and what plants need to live. • Plants can be grouped as flowering plants (including grasses) and non-flowering plants, e.g. ferns and mosses. • Plants are producers: they are the start of every food chain. • Plants in local habitats change through the year.	• Plants reproduce sexually (flowers, pollination, seeds) or asexually (e.g. cuttings, runners, tubers and bulbs). • A plant life cycle includes germination, growth, flowering, pollination, fertilisation, seed formation and dispersal. • The life cycle of plants differs from the life cycles of animals.	• Plants are one of the main groups of living things, alongside animals and micro-organisms. • Plants are adapted to their environment, e.g. cacti in deserts, tendrils on climbing plants and scented flowers to attract pollinators. • Adaptations can be advantageous or disadvantageous, depending on the environment.

		Key vocabulary: seed, plant, grow, water, roots, stem, leaf, flower, sun	**Key vocabulary:** deciduous, evergreen, trunk, branch, stem, root, bulb, seed, petal, fruit	**Key vocabulary:** germinate, seedling, mature, grow, healthy, water, light, temperature	**Key vocabulary:** function, nutrients, transport, pollination, pollen, seed dispersal, stigma, stamen, petal	**Key vocabulary:** flowering, non-flowering, producer, fern, moss, classify, habitat	**Key vocabulary:** reproduction, sexual, asexual, cutting, runner, tuber, fertilisation, life cycle	**Key vocabulary:** adaptation, environment, classify, characteristic, pollinator, advantage
	Skills	• Plant a seed and care for it. • Observe and talk about changes in plants through the seasons. • Draw and label a simple picture of a plant. • Name and describe some plants.	• Identify and name common plants, including deciduous and evergreen trees. • Observe closely using magnifying glasses and compare and contrast familiar plants. • Draw labelled diagrams showing the parts of plants and trees. • Record how plants change over time, e.g. leaves falling and buds opening.	• Observe and record the growth of seeds and bulbs over time, with some accuracy. • Set up a simple comparative test to show that plants need water and light. • Describe what they have observed using the correct vocabulary. • Record results in simple tables or charts and say what they have found out.	• Compare the effect of different factors on plant growth, e.g. light and fertiliser, planning and carrying out a fair test. • Investigate how water is transported in plants, e.g. celery or white carnations in coloured water. • Dissect a flower to identify its parts and observe the stages of the life cycle. • Look for patterns in the structure of fruits that relate to how seeds are dispersed. • Record observations in labelled diagrams, tables and bar charts.	• Use and make keys to identify and group local plants. • Observe how plants in the habitat change throughout the year. • Make a guide to local plants. • Raise and answer questions about plants and their habitat from observations.	• Grow new plants from cuttings, seeds, tubers or bulbs and compare how well they grow. • Observe and compare plant life cycles over a period of time. • Ask pertinent questions about similarities and differences in how plants reproduce. • Plan a fair test, identifying variables to change, measure and control.	• Use classification systems and keys to identify plants in the local environment. • Research unfamiliar plants from different habitats and decide where they belong. • Analyse the advantages and disadvantages of specific adaptations, e.g. tendrils or brightly coloured flowers. • Compare how plants are adapted to survive in extreme conditions, e.g. cacti.
		EYFS	**Key Stage 1**		**Key Stage 2**			
		Nursery/ Reception	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Animals, including Humans	**Knowledge**	• Identify different parts of my body. • We use our senses to find out about things. • Living things grow and change, e.g. babies grow into adults.	• Animals can be grouped as fish, amphibians, reptiles, birds and mammals. • Animals can be carnivores (eat meat), herbivores (eat plants) or	• Animals, including humans, have offspring which grow into adults, e.g. egg, chick, chicken. • Animals, including humans, need water, food and air to survive.	• Animals, including humans, cannot make their own food; they get nutrition from what they eat. • Humans need the right types and amounts of nutrition (carbohydrates, protein, fat, vitamins,	• The digestive system breaks down food: mouth, tongue, teeth, oesophagus, stomach, small and large intestine. • Humans have different types of teeth, each with a	• Humans change as they grow and develop to old age: baby, toddler, child, teenager (adolescent), adult and old age. • Puberty is the stage in which the body	• The circulatory system is made up of the heart, blood vessels and blood, and transports nutrients and water around the body. • The heart pumps blood around the body through the

		• Healthy bodies need food, drink, exercise and sleep. **Key vocabulary:** body, head, arms, legs, senses, grow, baby, healthy, animal	omnivores (eat both). • The human body has basic parts, and each sense is associated with a part of the body, e.g. eyes for sight. **Key vocabulary:** fish, amphibian, reptile, bird, mammal, carnivore, herbivore, omnivore, senses, head, neck, elbow, knee	• Humans need exercise, the right amounts of different types of food, and good hygiene to stay healthy. **Key vocabulary:** offspring, adult, life cycle, survive, water, food, air, exercise, hygiene, healthy	minerals, fibre and water). • Humans and some animals have skeletons and muscles for support, protection and movement. **Key vocabulary:** nutrition, skeleton, muscle, bone, joint, skull, ribs, spine, support, protection, movement, vertebrate	function: incisors, canines, premolars and molars. • Food chains show what eats what, and include producers, predators and prey. **Key vocabulary:** digestion, oesophagus, stomach, intestine, incisor, canine, molar, producer, predator, prey, food chain	changes as a child becomes an adult. • Different animals have different gestation periods and rates of growth. **Key vocabulary:** gestation, development, puberty, adolescent, adult, old age, timeline	blood vessels (arteries, veins and capillaries). • Diet, exercise, drugs and lifestyle affect how the body functions. • Some drugs and other substances can be harmful to the body. **Key vocabulary:** heart, pulse, blood vessel, artery, vein, circulatory, oxygen, nutrients, lifestyle, drugs
	Skills	• Name and identify parts of the body. • Use senses in hands-on exploration of natural things. • Talk about how they have changed since they were babies. • Talk about what keeps them healthy.	• Identify and name a variety of common animals, including pets. • Group animals by what they eat and describe and compare their structure. • Identify, name, draw and label the basic parts of the human body. • Use senses to compare textures, sounds and smells.	• Observe, through video or first-hand experience, how animals including humans grow. • Ask questions about what animals need to survive and what humans need to stay healthy. • Suggest ways to find answers to their questions. • Record findings in simple charts and use scientific vocabulary.	• Group animals with and without skeletons and observe and compare how they move. • Compare and contrast the diets of different animals and group them by what they eat. • Research food groups and design a healthy meal based on their findings. • Identify the main bones and muscles and explore what would happen without a skeleton.	• Construct and interpret a variety of food chains, identifying producers, predators and prey. • Compare the teeth of carnivores and herbivores and suggest reasons for differences. • Investigate what damages teeth and how to look after them. • Draw and discuss ideas about the digestive system and compare them with models or images.	• Draw a timeline showing the stages in the growth and development of humans. • Research and compare the gestation periods of other animals with humans. • Find out and record how the length and mass of a baby changes as it grows. • Use secondary sources to answer questions.	• Identify and name the main parts of the circulatory system and describe their functions. • Investigate the effect of exercise on pulse rate and present data in tables and graphs. • Explore the work of scientists and scientific research on diet, exercise, drugs, lifestyle and health. • Use evidence to explain how lifestyle choices affect the body.
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		• Minibeasts and other living things live outside.	• A variety of plants and animals live in	• Things can be living, dead, or have never been alive.	• Living things from the past are found as fossils in rocks.	• Living things can be grouped in a variety of ways; vertebrates	• Life cycles differ between a mammal,	• Living things are classified into broad groups (micro-

Living Things and their Habitats	**Knowledge**	• Living things have different needs and live in different places. • Some living things, e.g. caterpillars and frogs, change as they grow (life cycles). **Key vocabulary:** living, minibeast, habitat, home, life cycle, caterpillar, butterfly, frog	the local environment. • Animals taken from the local environment must be cared for and returned safely. • Living things can be seen to change through the seasons. **Key vocabulary:** local, environment, wild, garden, pond, tree, woodland, care	• Most living things live in a habitat to which they are suited, which meets their basic needs. • A micro-habitat is a very small habitat, e.g. under a log or stone. • A simple food chain shows how animals get their food from plants and other animals. **Key vocabulary:** living, dead, never alive, habitat, micro-habitat, food chain, shelter, depend	• Plants and animals in a habitat depend on each other (e.g. for food and shelter). • Living things can be sorted using a range of features. **Key vocabulary:** fossil, habitat, depend, feature, criteria, sort, group	(fish, amphibians, reptiles, birds, mammals) and invertebrates (snails and slugs, worms, spiders, insects). • Classification keys can be used to identify living things. • Environments can change, which can pose dangers to living things. • Humans can have positive and negative effects on environments. **Key vocabulary:** vertebrate, invertebrate, classification, key, environment, pollution, deforestation, nature reserve	an amphibian, an insect and a bird. • Reproduction in plants and animals can be sexual or asexual (in plants). • Naturalists and animal behaviourists, e.g. David Attenborough and Jane Goodall, have helped us understand living things. **Key vocabulary:** life cycle, metamorphosis, mammal, amphibian, insect, bird, reproduction, offspring	organisms, plants and animals) by observable similarities and differences; Carl Linnaeus pioneered classification. • Living things have changed over time; fossils provide information about living things that lived millions of years ago. • Offspring normally vary and are not identical to their parents, and adaptation may lead to evolution. • Charles Darwin, Alfred Wallace and Mary Anning contributed to ideas about evolution and fossils. **Key vocabulary:** classification, micro-organism, vertebrate, invertebrate, variation, inheritance, adaptation, evolution, fossil
	Skills	• Explore the natural world, observing animals and plants in the outdoor area. • Describe what they see, hear and feel while outside. • Observe and talk about the life cycles of living things. • Look after living things, e.g. a plant or minibeast.	• Use the local environment to explore and answer questions about plants and animals. • Observe closely and compare and contrast living things. • Describe how they identified and grouped living things.	• Sort and classify things as living, dead or never alive, recording in charts. • Describe how they decided where to place things and talk about ways of answering questions. • Construct a simple food chain, including humans.	• Sort living things using their own criteria, e.g. with Venn and Carroll diagrams. • Observe living things in a habitat and record what they find. • Talk about fossils and how they provide information about the past. • Retrieve and apply knowledge of food	• Use and make simple guides or keys to explore and identify local plants and animals. • Group a wide selection of living things and explain how they grouped them. • Make a guide to local living things. • Raise and answer questions about	• Observe and compare life cycles of living things in the local environment and around the world. • Ask pertinent questions and suggest reasons for similarities and differences. • Observe changes in an animal over a period of time, e.g.	• Use classification systems and keys to identify animals and plants in the immediate environment. • Give reasons for classifying plants and animals based on specific characteristics. • Research unfamiliar animals and plants and decide where they belong in the

			• Care for living things and return them safely after study.	• Describe the conditions in different habitats and micro-habitats and how they affect what lives there.	chains and habitats to explain where living things live.	human impact on environments, using secondary sources.	hatching chicks, where possible. • Research the work of naturalists and communicate findings.	classification system. • Compare how living things are adapted to extreme conditions and analyse the advantages and disadvantages of adaptations.
		EYFS	**Key Stage 1**		**Key Stage 2**			
		Nursery/ Reception	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Materials and their Properties	**Knowledge**	• Materials can be sorted by how they look and feel. • Some materials are the same and some are different. • Materials can change state, e.g. ice melts when it is warm.	• An object is made from a material; the object and the material are not the same thing. • Everyday materials include wood, plastic, glass, metal, water and rock (and brick, paper, fabrics, elastic and foil). • Materials have simple physical properties, e.g. hard/soft, stretchy/stiff, shiny/dull, rough/smooth, bendy/not bendy, waterproof/not waterproof, absorbent/not absorbent, opaque/transparent.	• Materials are chosen for particular uses because of their properties; the same material can be used for many things and different materials can be used for the same thing. • The shape of some solid objects can be changed by squashing, bending, twisting and stretching. • Some people have developed useful new materials, e.g. John Dunlop, Charles Macintosh and John McAdam.	• Rocks can be compared and grouped by appearance and simple physical properties, e.g. grains, crystals, hard or soft. • Fossils are formed when things that have lived are trapped within rock. • Soils are made from rocks and organic matter.	• Materials can be solids, liquids or gases: solids hold their shape, liquids form a pool not a pile, gases escape from an unsealed container. • Materials change state when heated or cooled; the temperature at which this happens is measured in °C. • Evaporation and condensation are part of the water cycle, and evaporation is faster at higher temperatures.	• Materials can be grouped by hardness, solubility, transparency, electrical and thermal conductivity, and response to magnets. • A soluble solid dissolves in a liquid to form a solution; mixtures can be separated by filtering, sieving and evaporating. • Dissolving, mixing and changes of state are reversible changes. • Some changes form new materials and are not usually reversible, e.g. burning, rusting and vinegar with bicarbonate of soda.	• Revisit: the properties of materials explain why they are chosen, e.g. conductors and insulators in circuits. • Revisit: reversible and irreversible changes and states of matter explain everyday changes, e.g. cooking. • Evidence from tests is used to justify why a material is chosen for a purpose.

		Key vocabulary: hard, soft, rough, smooth, wet, dry, melt, freeze, ice, water	**Key vocabulary:** object, material, property, wood, plastic, glass, metal, hard, soft, waterproof, absorbent, transparent	**Key vocabulary:** suitable, unsuitable, squash, bend, twist, stretch, flexible, rigid, brick, paper, cardboard	**Key vocabulary:** rock, igneous, sedimentary, metamorphic, permeable, fossil, soil, organic matter, grain, crystal	**Key vocabulary:** solid, liquid, gas, melt, freeze, evaporate, condense, boil, particles, temperature, water cycle, °C	**Key vocabulary:** soluble, insoluble, solution, dissolve, filter, sieve, evaporate, reversible, irreversible, conductor, insulator	**Key vocabulary:** property, suitable, conductor, insulator, reversible, irreversible, evidence, justify
	Skills	• Explore and sort collections of materials with similar and different properties. • Talk about what they see, hear and feel using a wide vocabulary. • Talk about changes, e.g. that ice melts. • Explore how materials change when they are mixed, heated or cooled safely.	• Distinguish between an object and its material and name everyday materials. • Describe the simple physical properties of materials. • Compare and group materials by their properties. • Perform simple tests, e.g. which material is best for an umbrella?	• Identify and compare the suitability of materials for particular uses. • Test how materials change shape when squashed, bent, twisted and stretched. • Observe closely, classify and record the uses of materials in and around school. • Suggest unusual and creative uses for everyday materials.	• Observe rocks with a hand lens and group them by their features. • Test rocks, e.g. for hardness and permeability, and record findings. • Research how fossils are formed and use evidence to explain it. • Explore soils, identify similarities and differences, and investigate how soils form.	• Group and classify materials as solids, liquids or gases. • Use thermometers or data loggers to measure temperature as materials are heated or cooled. • Observe and record evaporation over time and investigate the effect of temperature. • Research the temperatures at which materials change state.	• Carry out fair tests to compare materials, e.g. which is the most effective insulator. • Separate mixtures using filtering, sieving and evaporating, and recover a dissolved substance. • Observe and compare reversible and irreversible changes and record the evidence. • Give reasons for the uses of materials based on test results.	• Plan a test to compare materials, selecting variables and justifying their choices. • Use test results to select a material for a purpose, e.g. for a circuit. • Apply their knowledge of changes to explain everyday processes. • Present and evaluate their evidence in line graphs and tables.
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		Nursery/ Reception	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Forces and Magnets	**Knowledge**	• Things can be pushed and pulled. • Some things roll and some things slide. • Magnets attract some things but not others.	• Things can be moved by pushing or pulling them. • Different objects move in different ways, e.g. rolling, sliding and spinning. • Some objects are stopped or slowed down by the surface they move on.	• A force can change the shape of some materials: squashing, bending, twisting and stretching. • Pushes and pulls are examples of forces. • Different materials respond differently when a force acts on them.	• Things move differently on different surfaces; most forces need contact between two objects. • Magnetic forces can act at a distance, without contact. • Magnets attract or repel each other and attract some materials, e.g. iron,	• Revisit: pushes and pulls can start, stop, speed up, slow down or change the direction of movement. • Revisit: magnets can be used in everyday items, e.g. fridge doors. • Forces are involved when	• Gravity is a force that pulls unsupported objects towards the Earth. • Air resistance, water resistance and friction act between moving surfaces and slow objects down. • Levers, pulleys and gears are	• Revisit: gravity, friction and resistance forces explain how everyday objects move. • Revisit: simple mechanisms (levers, pulleys and gears) are used in machines. • Forces explain how living things are

					but not others; they have two poles. • Like poles repel and unlike poles attract.	objects change shape or direction, e.g. vibrating objects in sound.	mechanisms that allow a smaller force to have a greater effect. • Galileo Galilei and Isaac Newton helped to develop the theory of gravitation.	adapted, e.g. streamlined shapes in fish.
		Key vocabulary: push, pull, fast, slow, roll, slide, magnet, stick	**Key vocabulary:** push, pull, move, stop, roll, slide, spin, surface	**Key vocabulary:** force, squash, bend, twist, stretch, push, pull, material	**Key vocabulary:** force, contact, friction, magnet, magnetic, pole, attract, repel, north pole, south pole, surface	**Key vocabulary:** force, speed up, slow down, direction, magnetic, attract, repel	**Key vocabulary:** gravity, air resistance, water resistance, friction, newton, lever, pulley, gear, mechanism	**Key vocabulary:** gravity, friction, resistance, streamlined, mechanism, balanced, unbalanced
	Skills	• Explore how things move by pushing, pulling, rolling and sliding. • Explore magnets and talk about what they notice. • Compare how different objects move. • Talk about what happens when they change something.	• Explore and describe how things move when pushed and pulled. • Compare how different objects move and group them. • Perform simple tests, e.g. which toy car goes furthest? • Record simple observations.	• Explore and describe the effect of forces on materials. • Observe changes in shape and record observations. • Sort materials by how they respond to forces. • Link their findings to the uses of materials.	• Compare how things move on different surfaces; raise questions and carry out fair tests; gather and record data in tables and bar charts. • Compare and group materials by whether they are attracted to a magnet and identify some magnetic materials. • Predict whether two magnets will attract or repel, depending on which poles face each other. • Explore the strengths of different magnets and find a fair way to compare them. • Draw diagrams using arrows to show attraction and repulsion.	• Use retrieved knowledge to describe forces in everyday life. • Observe and describe how forces affect the movement of objects. • Use what they know of magnets to make predictions. • Make simple models, e.g. in DT, that use pushes and pulls.	• Explore falling objects, e.g. paper cones or cup-cake cases, and the effect of air resistance. • Design, make and fair test parachutes and boats of different shapes. • Explore the effects of friction, e.g. a brake on a bicycle wheel. • Explore levers, pulleys and gears and explain how they reduce the force needed. • Take repeat measurements and record them accurately.	• Use evidence from earlier tests to explain how forces affect movement. • Apply their understanding to design problems, e.g. in DT. • Plan and carry out a fair test about forces, controlling variables. • Explain results using causal vocabulary.

		EYFS	Key Stage 1		Key Stage 2			
		Nursery/ Reception	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Light and Sound	**Knowledge**	• We use our eyes to see and our ears to hear. • Some things make sounds, e.g. instruments. • Light and dark are different; shadows can be made. **Key vocabulary:** light, dark, shadow, sound, loud, quiet, hear, see, instrument	• The eyes are used for seeing and the ears for hearing. • Some materials are transparent (light passes through) and some are opaque. • Different sounds can be made by different objects. **Key vocabulary:** eyes, ears, see, hear, sound, loud, quiet, transparent, opaque	• Transparent materials are used where we need to see through, e.g. windows. • Shiny or reflective materials can make things easier to see. • Sounds can be loud, quiet, high or low. **Key vocabulary:** transparent, opaque, reflective, shiny, window, loud, quiet	• We need light to see things; dark is the absence of light. • Light is reflected from surfaces; light from the Sun can be dangerous and our eyes must be protected. • Shadows form when light from a light source is blocked by an opaque object. • The size of a shadow changes with the distance between the light source and the object. **Key vocabulary:** light source, reflect, reflection, shadow, opaque, translucent, transparent, dark, ray, mirror	• Sounds are made when objects vibrate and travel as vibrations through a medium (solid, liquid or gas) to the ear. • The pitch of a sound is related to the features of the object that produced it; volume is related to the strength of the vibrations. • Sounds get fainter as the distance from the source increases. **Key vocabulary:** vibration, sound wave, medium, pitch, volume, high, low, faint, sound source, insulation	• Revisit: light sources, reflection and shadows, and sound sources and vibrations. • The size and position of shadows change as the Sun appears to move across the sky (see Earth and Space). • Materials can be chosen to block or absorb light and sound. **Key vocabulary:** light source, shadow, vibration, reflect, absorb, sundial, block	• Light appears to travel in straight lines. • We see objects because they give out or reflect light into our eyes; light travels from light sources to our eyes, or from light sources to objects and then to our eyes. • Shadows have the same shape as the objects that cast them because light travels in straight lines. **Key vocabulary:** straight lines, light source, reflect, periscope, shadow, beam, eye, rear-view mirror
	Skills	• Explore light and dark and make shadows. • Listen to and make a range of sounds. • Talk about what they can see and hear. • Explore sounds with instruments.	• Use their eyes and ears to make simple observations. • Sort materials as transparent or opaque. • Compare sounds made by different objects. • Describe what they see and hear using simple language.	• Test which materials are transparent and which are opaque. • Explore reflective materials and describe their uses. • Compare and group sounds. • Use simple records to share their findings.	• Look for patterns in how the size of a shadow changes when the light source or the object moves. • Explore how light reflects off mirrors and other reflective surfaces. • Measure shadows, record data in tables and describe patterns. • Explain how to keep safe in the Sun and why we should not look directly at it.	• Find patterns between the pitch of a sound and features of the object, e.g. size, tension or thickness. • Find patterns between volume and the strength of vibrations. • Make and test earmuffs to find which materials give the best sound insulation. • Make and play instruments, using	• Use retrieved knowledge to explain shadow changes during the day. • Make shadow clocks and sundials and use them to measure time. • Test materials that block light or sound. • Record observations in tables and graphs.	• Design and make a periscope and explain how it works using the idea of straight-line light. • Use shadow puppets to investigate the relationship between light source, object and shadow. • Decide where to place a rear-view mirror on a car and explain their reasoning.

						what they have found out.		• Make predictions and explain what happens using the correct scientific vocabulary.
		EYFS	**Key Stage 1**		**Key Stage 2**			
		Nursery/ Reception	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Electricity	**Knowledge**	• Some toys use batteries to work. • Switches turn things on and off. • Electricity can be dangerous, so only adults use mains sockets. **Key vocabulary:** battery, switch, on, off, light, sound, safe, toy	• Many everyday products, e.g. torches and toys, use electricity. • Electricity from the mains is dangerous. • Batteries power some everyday products. **Key vocabulary:** electricity, battery, mains, switch, torch, safe, dangerous	• Electrical products, e.g. a kettle or a lamp, have a purpose. • Electricity from the mains is dangerous and only adults may use mains sockets. • Some materials, e.g. metals, are used to carry electricity and others are used for safety, e.g. plastic. **Key vocabulary:** appliance, electricity, mains, battery, metal, plastic, safe, dangerous	• Revisit: common appliances run on electricity, which can come from the mains or from batteries. • Magnets are often found in appliances and everyday items. • Safety precautions for working with electricity. **Key vocabulary:** appliance, mains, battery, cell, safety, magnet, electricity	• Common appliances run on electricity. • A simple series circuit has cells, wires, bulbs, switches and buzzers; a lamp lights only if it is part of a complete loop with a battery. • A switch opens and closes a circuit. • Metals are good conductors of electricity; some other materials are insulators. **Key vocabulary:** circuit, series circuit, cell, battery, wire, bulb, buzzer, switch, motor, complete, conductor, insulator	• Revisit: conductors and insulators and the properties of materials. • Some conductors produce a brighter bulb than others. • Materials can be compared to make a switch in a circuit. **Key vocabulary:** conductor, insulator, circuit, bulb, switch, property, test	• The brightness of a lamp or the volume of a buzzer is related to the number and voltage of cells in a circuit. • Components function differently depending on the circuit, e.g. bulb brightness, buzzer loudness and switch position. • Recognised symbols are used to represent a simple series circuit in a diagram. **Key vocabulary:** cell, voltage, bulb, buzzer, motor, switch, series circuit, circuit symbol, component
	Skills	• Explore battery-powered toys and talk about how they work. • Switch things on and off safely. • Follow rules about electrical items. • Talk about what they notice.	• Identify products that use electricity. • Follow safety rules about electricity. • Sort things that use electricity and things that do not. • Talk about what electrical things are used for.	• Identify and name electrical appliances at home and in school. • Sort appliances by whether they use batteries or the mains. • Follow safety rules around electricity.	• Identify common appliances and describe what they do. • Explore simple devices using batteries, e.g. a torch, with support. • Use retrieved knowledge to talk about safety.	• Construct a simple series circuit and identify and name its basic parts. • Predict whether a lamp will light, and test it. • Try different components, including	• Observe patterns, e.g. metals tend to be conductors. • Test materials by connecting them in a circuit and record the results. • Compare materials to make a switch in a circuit.	• Systematically identify the effect of changing one component at a time in a circuit. • Use recognised symbols to draw simple series circuit diagrams. • Design and make a useful circuit, e.g.

				• Use simple vocabulary to describe how appliances are used.	• Ask questions about how appliances work.	switches, and use circuits to create simple devices. • Draw circuits as pictorial representations. • Test and record which materials are conductors and insulators.	• Explain why some materials are used in electrical items.	traffic lights or a burglar alarm. • Compare and give reasons for variations in how components function and record results in tables or graphs.
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Earth, Space and Seasonal Change	**Knowledge**	• The weather and seasons change. • Day and night are different; the Sun gives us light. • We can talk about changes through the seasons.	• There are four seasons and the weather changes with each. • Day length varies with the seasons. • Plants and animals change through the seasons. • It is not safe to look directly at the Sun, even when wearing dark glasses.	• Living things respond to the seasons, e.g. leaves fall and some animals hibernate. • Habitats change through the seasons. • The Sun is the Earth's main source of light and heat.	• Shadows change length during the day as the Sun's position changes. • Light from the Sun can be dangerous. • Seasonal changes affect day length, light and plant growth.	• The water cycle links evaporation and condensation to weather. • Weather changes with the seasons and affects living things. • Rainfall, temperature and day length are measured and recorded.	• The Sun is a star at the centre of our solar system with eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune. • The Earth rotates, which causes day and night and the apparent movement of the Sun across the sky; the Moon orbits the Earth. • The Sun, Earth and Moon are approximately spherical. • Ideas about the solar system have developed over time, from the geocentric to the heliocentric model (e.g. Ptolemy, Alhazen, Copernicus).	• Revisit: day and night, the Earth's rotation and the Moon's orbit. • Light travels in a straight line from the Sun, which explains why shadows form. • Scientific ideas about space change as new evidence becomes available.

		Key vocabulary: weather, season, spring, summer, autumn, winter, day, night, Sun, Moon	**Key vocabulary:** season, weather, day length, spring, summer, autumn, winter, sunrise, sunset, temperature	**Key vocabulary:** season, habitat, hibernate, deciduous, weather, sunlight, warm	**Key vocabulary:** Sun, shadow, daylight, season, shade, sunrise, sunset	**Key vocabulary:** weather, rainfall, evaporation, condensation, water cycle, temperature, season	**Key vocabulary:** solar system, planet, orbit, rotate, star, moon, sphere, geocentric, heliocentric	**Key vocabulary:** rotate, orbit, light source, shadow, model, evidence, heliocentric
	Skills	• Observe and talk about changes through the seasons. • Describe the weather and what they see, hear and feel outside. • Notice the difference between day and night. • Talk about changes in the world around them.	• Observe changes across the four seasons. • Observe and describe the weather and how day length varies. • Make tables and charts about the weather. • Keep a weather chart and use it to answer questions.	• Observe how plants and animals change through the seasons. • Compare habitats at different times of the year. • Record observations in tables or drawings. • Ask and answer questions about the seasons.	• Measure and record shadow lengths at different times of the day. • Look for patterns in the data. • Explain how to protect their eyes from the Sun. • Make predictions about shadows.	• Observe and record evaporation, e.g. a puddle, over a period of time. • Record weather data using standard units, e.g. thermometer and rain gauge. • Present weather data in tables and graphs. • Describe links between weather and the water cycle.	• Create simple models of the solar system and of the Sun, Earth and Moon. • Use models to explain day and night and the apparent movement of the Sun. • Compare the time of day at different places on Earth. • Construct simple shadow clocks and sundials. • Research how ideas about the solar system developed.	• Use models to explain day and night and the movement of the Moon. • Use evidence from observations to support explanations. • Evaluate how scientific ideas about space have changed. • Present findings using correct scientific vocabulary.