



# Subject Area: Science

Science at **Early Years Foundation Stage** is introduced indirectly through activities that encourage your child to explore, problem solve, observe, predict, think, make decisions and talk about the world around them. It's called 'understanding the world'.

## Understanding the World

Children explore creatures, people, plants and objects in their natural environments. They observe and manipulate objects and materials to identify differences and similarities. For example, they may look at an egg whisk, sand, paper and water to learn about things that are natural and manmade and their different functions. Children also learn to use their senses, feeling dough or listening to sounds in the environment, such as sirens or farm animals. Pupils observe changes for example growing plants and observing the life cycle of frogs.

Children are encouraged to ask questions about why things happen and how things work. They might do activities such as increasing the incline of a slope to observe how fast a vehicle travels or opening a mechanical toy to see how it works. Your child will also be asked questions about what they think will happen to help them communicate, plan, investigate, record and evaluate findings. Children are encouraged to make predictions about what they think might happen linked to their prior knowledge.

## Physical Development

Awareness of space may be taught by encouraging children to make big and small movements to music and to think about how much space they need. They will also learn to recognise changes that happen to the body when they are active.

Children will also learn about the importance of keeping healthy and the things that contribute to this by, for example, cooking or identifying fruit and vegetables.

## Expressive art and Design

Children explore and respond to a variety of sensory experiences through music and art. Children might collect materials, such as rough sandpaper, soft fabric and shiny bottle tops to build a sensory wall. They explore colour, texture, shape, form and space by mixing colours, painting, modelling and dancing. Children also learn about sounds - how they can be changed and how to imitate sounds they hear.

## Ideas for developing scientific thinking at home:

Have fun around the house using your five senses. Listen out for the sound of the oven timer; identify objects by feeling around in a bag; taste salty and sweet foods.

Talk about how the body works (healing, the role of food).

Do you have a houseplant that has outgrown its pot? Allow your child to help you re-pot it. Point out and discuss how the roots sustain plant life.

Talk to your child about what happens when water is heated. With caution, show what happens.

Ask your child to find things that need either a pull or push to make them work (doorbell, rocking chair, door, drawer).

Talk about electricity and its potential dangers. Survey the electrical appliances, plug sockets and lights in your home. Demonstrate how unplugging the television, for example, will stop it from working.

Explore the sound of music! Use whatever you have - pots and pans, glass utensils, hollow plastics and empty boxes. Suggest ways of describing the sounds (high, low, loud, quiet, rattling, ringing).

The Early Years curriculum enables children to acquire the knowledge and skills in preparation for the Key Stage 1 curriculum.

Knowledge / Skills	Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Working Scientifically	Explore the natural world around them, making observations and drawings.	<p>Asking simple questions and recognising that they can be answered in different ways.</p> <p>Observing closely, using simple equipment.</p> <p>Performing simple tests.</p> <p>Identifying and classifying.</p> <p>Using their observations and ideas to suggest answers to questions.</p> <p>Gathering and recording data to help in answering questions.</p>	<p>Asking simple questions and recognising that they can be answered in different ways.</p> <p>Observing closely, using simple equipment.</p> <p>Performing simple tests.</p> <p>Identifying and classifying.</p> <p>Using their observations and ideas to suggest answers to questions.</p> <p>Gathering and recording data to help in answering questions.</p>	<p>Asking relevant questions and using different types of scientific enquiries to answer them.</p> <p>Setting up simple practical enquiries, comparative and fair tests.</p> <p>Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment.</p> <p>Gathering, recording, classifying and presenting data in a variety of ways.</p> <p>Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</p> <p>Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</p> <p>Using results to draw simple conclusions, make predictions for values, suggest</p>	<p>Asking relevant questions and using different types of scientific enquiries to answer them.</p> <p>Setting up simple practical enquiries, comparative and fair tests.</p> <p>Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment</p> <p>Gathering, recording, classifying and presenting data in a variety of ways.</p> <p>Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</p> <p>Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</p> <p>Using results to draw simple conclusions, make predictions for new values, suggest</p>	<p>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</p> <p>Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</p> <p>Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p> <p>Using test results to make predictions to set up further comparative and fair tests.</p> <p>Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations.</p>	<p>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</p> <p>Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</p> <p>Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p> <p>Using test results to make predictions to set up further comparative and fair tests.</p> <p>Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations.</p>

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				<p>improvements, raise questions.</p> <p>Identifying differences, similarities or changes.</p> <p>Using straightforward scientific evidence to answer questions/ findings.</p>	<p>improvements and raise further questions.</p> <p>Identifying differences, similarities or changes related to simple scientific ideas and processes.</p> <p>Using straightforward scientific evidence to answer questions /findings</p>	<p>Identifying scientific evidence that has been used to support or refute ideas or arguments.</p>	<p>Identifying scientific evidence that has been used to support or refute ideas or arguments.</p>
<p>Plants</p> <p>Living Things</p> <p>Evolution</p>	<p>Explore the natural world around them, making observations and drawing pictures of animals and plants;</p>	<p><b>Plants</b></p> <p>Identify and name a variety of plants.</p> <p>Identify and describe the basic structure of plants.</p> <p><b>deciduous</b></p> <p><b>evergreen</b></p> <p><b>leaves</b></p> <p><b>flowers</b></p> <p><b>blossom</b></p> <p><b>petals</b></p> <p><b>fruit</b></p> <p><b>roots</b></p> <p><b>bulb</b></p> <p><b>seed</b></p> <p><b>trunk</b></p> <p><b>branch</b></p> <p><b>stem</b></p> <p><b>names of common plants and tree</b></p>	<p><b>Plants</b></p> <p>Observe and describe how seeds and bulbs grow.</p> <p>Find out and describe how plants need water, light and a suitable temperature.</p> <p><b>Living Things</b></p> <p>Explore and compare the differences between things that are living, dead, and never been alive.</p> <p>Living things live in habitats.</p> <p>Describe how different habitats provide for the basic needs.</p> <p>Identify and name a variety of plants and animals in their</p>	<p><b>Plants</b></p> <p>Identify and describe the functions of different parts of flowering plants.</p> <p>Explore the requirements of plants for life and growth and how they vary.</p> <p>Investigate the way in which water is transported within plants.</p> <p>Explore the part that flowers play in the life cycle of flowering plants.</p> <p><b>function</b></p> <p><b>root</b></p> <p><b>stem</b></p> <p><b>trunk</b></p> <p><b>leaves/leaf</b></p>	<p><b>Living things and their habitats</b></p> <p>Recognise that living things can be grouped in a variety of ways.</p> <p>Explore and use classification keys.</p> <p>Recognise that environments can change and that this can sometimes pose dangers to living things.</p>	<p><b>Living things and their habitats</b></p> <p>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.</p> <p>Describe the life process of reproduction in some plants and animals.</p>	<p><b>Living things and their habitats</b></p> <p>Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences.</p> <p>Give reasons for classifying plants and animals.</p> <p><b>micro-organisms</b></p> <p><b>classification</b></p> <p><b>invertebrates</b></p> <p><b>vertebrates</b></p>

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			habitats, including microhabitats. Describe food chains and identify and name different sources of food. germination growth survival reproduction (seed/bulb) living / dead / habitat / microhabitat basic needs food chain consumer / producer life processes	flower pistil stamen male female pollen nutrients transport seed dispersal pollination seed formation fertiliser life cycle			
Animals including humans		<b>Animals, including humans</b> Identify and name a variety of common animals. 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. Identify, name, draw and label the basic parts of the human body.	<b>Animals, including humans</b> Notice that animals, including humans, have offspring which grow into adults. Find out about and describe the basic needs of animals. Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. life cycle baby/young offspring	<b>Animals, including humans</b> Identify that animals, including humans, need the right types and amount of nutrition. Identify that humans and some other animals have skeletons and muscles for support, protection and movement. nutrition skeleton endoskeleton exoskeleton invertebrate hydrostatic	<b>Animals, including humans</b> Describe the simple functions of the human digestive system. Identify human teeth and their functions. Construct and interpret food chains, id producers, predators and prey. mouth / tongue / teeth oesophagus stomach small / large intestine digestive system / digestion	<b>Animals, including humans</b> Describe the changes as humans develop to old age. life cycle life processes reproduction reproduce sexual asexual	<b>Animals, including humans</b> Identify and name the main parts of the human circulatory system. Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. Describe the ways in which nutrients and water are transported within animals. circulation / circulatory system heart blood vessel / blood

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		<p>fish amphibian reptile bird mammal insect pet</p> <p>head / neck / arm / elbow / leg / knee / face / ear / eye / hair / mouth / teeth</p> <p>senses smell taste touch sound sight</p>	<p>adult</p> <p>basic needs exercise nutrition hygiene water food air health</p> <p>survive</p>	<p>muscle protection movement</p>	<p>carnivores / herbivores / omnivores premolars / incisors / molars / canine</p> <p><b>Sound</b></p> <p>Identify how sounds are made. Recognise that vibrations from sounds travel through a medium to the ear.</p> <p>Find patterns between pitch of a sound and features of the producing object.</p> <p>Find patterns between the volume of a sound and the strength of the vibrations that produced it.</p> <p>Recognise that sounds get fainter further away.</p> <p>vibration / pitch / volume sound source produce</p>		<p>transport nutrients drugs exercise lifestyle</p> <p><b>Evolution and inheritance</b></p> <p>Recognise that living things have changed over time and that fossils provide information.</p> <p>Recognise that living things produce offspring.</p> <p>Identify how animals and plants are adapted to suit their environment.</p> <p>fossil offspring adaptation evolution</p>
RSE (linked to PSHE)		<p>Know that changes happen when we grow up</p> <p>Know that people grow up at different rates and that is normal</p>	<p>Know how their bodies have changed from when they were a baby and that they will continue to change as they age</p>	<p>Know that in animals and humans lots of changes happen between conception and growing up</p>	<p>Know that personal characteristics are inherited from birth parents and this is brought about by an ovum joining with a sperm</p>	<p>Know how girls' and boys' bodies change during puberty and understand the importance of looking after themselves physically and</p>	<p>Know how girls' and boys' bodies change during puberty and understand the importance of looking after themselves physically and emotionally</p>

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		<p>Know the names of male and female private body parts</p> <p>Know that there are correct names for private body parts and nicknames, and when to use them</p> <p>Know which parts of the body are private and that they belong to that person and that nobody has the right to hurt these</p>	<p>Know the physical differences between male and female bodies</p> <p>Know the correct names for private body parts</p> <p>Know that private body parts are special and that no one has the right to hurt these</p>	<p>Know that in nature it is usually the female that carries the baby</p> <p>Know that in humans a mother carries the baby in her uterus (womb) and this is where it develops</p> <p>Know that babies need love and care from their parents/carers</p> <p>Know some of the changes that happen between being a baby and a child</p> <p>Know that the male and female body needs to change at puberty so their bodies can make babies when they are adults</p> <p>Know some of the outside body changes that happen during puberty</p> <p>Know some of the changes on the inside that happen during puberty.</p>	<p>Know that babies are made by a sperm joining with an ovum</p> <p>Know the names of the different internal and external body parts that are needed to make a baby</p> <p>Know how the female and male body change at puberty</p> <p>Know that personal hygiene is important during puberty and as an adult</p>	<p>emotionally</p> <p>Know that sexual intercourse can lead to conception</p> <p>Know that some people need help to conceive</p> <p>Know that becoming a teenager involves various changes and also brings growing responsibility</p>	<p>Know how a baby develops from conception through the nine months of pregnancy and how it is born</p>
<p>Earth and Space</p> <p>Rocks and Soils</p> <p>Light / Seasons</p>	<p>Know some similarities and differences between the natural world around them and</p>	<p><b>Seasonal changes</b></p> <p>Observe changes across the 4 seasons.</p> <p>Observe and describe weather associated with the seasons and how day length varies</p>		<p><b>Light</b></p> <p>Know light is needed to see things and that dark is the absence of light.</p> <p>Notice that light is reflected from surfaces.</p>		<p><b>Earth and space</b></p> <p>Describe the movement of the Earth and other planets.</p> <p>Describe the movement of the moon.</p>	<p><b>Light</b></p> <p>Recognise that light appears to travel in straight lines.</p> <p>Explain that objects are seen because they give out or reflect light.</p>

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	<p>contrasting environments , drawing on their experiences and what has been read in class.</p>	<p>Spring Summer Autumn Winter</p> <p>weather season seasonal changes</p> <p>night day</p>		<p>Recognise that light from the sun can be dangerous.</p> <p>Know how shadows are formed and how they change size.</p> <p>opaque transparent translucent shadow reflect light source</p> <p><b>Rocks</b></p> <p>Compare and group together different rocks.</p> <p>Describe how fossils are formed.</p> <p>Recognise that soils are made from rocks and organic matter.</p> <p>soil rock fossil sedimentary igneous metamorphic</p> <p>grains crystals</p> <p>permeable/non</p>		<p>Describe the sun, Earth and moon as approximately spherical bodies.</p> <p>Use the idea of the Earth's rotation to explain day and night.</p> <p>planets solar system moon star celestial spherical dwarf planet geocentric heliocentric</p>	<p>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.</p> <p>Explain why shadows have the same shape as the objects that cast them.</p> <p>reflect light travel opaque transparent translucent</p>

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Materials / States of Matter  Forces  Electricity	Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	<p><b>Everyday materials</b></p> <p>Distinguish between an object and the material from which it is made.</p> <p>Identify and name a variety of everyday materials.</p> <p>Describe the simple physical properties of a variety of everyday materials.</p> <p>Compare and group together a variety of everyday materials.</p> <p>hard/soft stretchy/stiff shiny/dull rough/smooth bendy/rigid waterproof/not absorbent/not opaque/transparent</p> <p>plastic metal glass wood water rock brick paper fabric elastic foil</p>	<p><b>Uses of everyday materials</b></p> <p>Identify and compare the suitability of a variety of everyday materials.</p> <p>Find out how the shapes of solid objects made from some materials can be changed by squashing etc.</p> <p>wood metal plastic glass brick rock paper cardboard</p> <p>properties</p> <p>solid</p> <p>squash bend twist stretch</p>	<p><b>Forces and magnets</b></p> <p>Compare how things move on different surfaces.</p> <p>Notice that some forces need contact between 2 objects, but magnetic forces can act at a distance.</p> <p>Observe how magnets attract or repel each other and attract some materials and not others.</p> <p>Compare and group together a variety of everyday materials on the basis of whether they are magnetic materials.</p> <p>Describe magnets as having 2 poles.</p> <p>Predict whether 2 magnets will attract or repel each other.</p> <p>repel attract magnetic field magnet material poles force</p> <p>bar magnet ring magnet button magnet horseshoe magnet</p> <p>friction</p>	<p><b>States of matter</b></p> <p>Compare and group materials together, according to whether they are solids, liquids or gases.</p> <p>Observe that some materials change state when heated or cooled, and measure the temperature.</p> <p>Identify the part played by evaporation and condensation in the water cycle.</p> <p>temperature Celsius solid liquid gas change of state evaporation condensation water cycle</p> <p><b>Electricity</b></p> <p>Identify common appliances.</p> <p>Construct a simple series electrical circuit.</p> <p>Identify if a lamp will light in a simple series circuit, based on whether or not the lamp is part of a</p>	<p><b>Properties and changes of materials</b></p> <p>Compare and group materials by their properties.</p> <p>Understand solutions and describe how to recover a substance from a solution.</p> <p>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering etc.</p> <p>Give reasons for uses of everyday materials. Demonstrate that dissolving, mixing and changes of state are reversible changes.</p> <p>Explain that some changes result in new materials.</p> <p>hardness solubility conductivity magnetism transparency solution dissolve liquid / solid / gas filtering / sieving evaporating mixture reversible / irreversible</p>	<p><b>Electricity</b></p> <p>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.</p> <p>Compare and give reasons for variations in how components function, including the brightness of bulbs etc.</p> <p>Use recognised symbols in a diagram.</p> <p>cells voltage simple circuit symbol component</p>

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					<p>complete loop with a battery.</p> <p>Recognise that a switch opens and closes a circuit.</p> <p>Recognise some common conductors and insulators.</p> <p>series circuit wire / bulb / cell / buzzer / loop / electrical / electricity / appliance conductor / insulator</p>	<p><b>Forces</b></p> <p>Explain that unsupported objects fall towards the Earth due to force of gravity.</p> <p>Identify the effects of air/ water resistance and friction.</p> <p>Recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect.</p> <p>pulley gear spring lever water / air resistance gravity friction</p>	