



Adelaide Primary School

Knowledge and Vocabulary Progression Intent

Science

The intention of the Science curriculum

Through building up a body of key foundational knowledge and concepts, all pupils will be enthused about science and learning about the world we live in. By working together on a hands on, enquiry based approach, pupils will have the opportunity to become the scientists of the future.

The science curriculum will:

- encourage pupils to recognise the power of rational explanation
- develop pupils' sense of excitement
- develop pupils' curiosity about natural phenomena
- encourage pupils to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

What are the key features of 'knowledge-rich' curriculum for Science?

At both key stages the curriculum knowledge takes full account of the national curriculum's main characteristics of Physics, Chemistry, Biology, Working scientifically

This document outlines the knowledge, vocabulary and skills within our curriculum for Science and includes both 'now knowledge' and 'sticky knowledge'.

There is a difference between knowledge which will be retained close to the point of teaching and develop a broad, general understanding (now knowledge) and that which will be retained in the long-term memory (sticky knowledge).

The working scientifically part does not conform with the knowledge-rich system as it is checking on pupils' ability to, amongst other things, carry out research, ask questions and carry out tests.

Vision

All children will become scientifically able through our hands-on and engaging, inquiry based approach that stimulates children's curiosity and enjoyment to find out about the world around them.

Aims

At Adelaide Primary School, we aim for our science teaching to develop a sense of excitement and curiosity about the world in which we live. Our teachers aim to share scientific knowledge and conceptual understanding with children through the careful planning of enquiry-based science lessons. Teachers give clear and accurate explanations and offer skilful questioning. We firmly believe that children should be fully equipped with the science knowledge to understand the uses and applications of science today and for the future.

Planning and Coverage

Adelaide Primary School recognises science as a core subject. It is a requirement that science is taught the equivalent of one and a half hours each week minimum. Teachers have the flexibility to teach science as a block so that children can become fully immersed in a scientific idea. Children at Adelaide Primary School learn through a thematic curriculum, with the teaching and learning of science being based on investigation. The theme is changed at least termly to ensure children are exposed to many different scientific topics throughout their time at school. Children in the foundation stage are taught the science elements as indicated in the development matters curriculum through: Knowledge and Understanding of the World. Children in Year 1 to Year 6 are taught in accordance with the National Curriculum, ensuring working scientifically is interwoven throughout. We encourage children to ask and answer their own questions as often as they like. Children should complete at least one investigation per half term. These investigations should be based on their current topic but have a focus on developing the children's scientific skills.

A.C.E. Long Term Plan for Science

| | Biology | | Chemistry | Physics | | |
|------------|--|---|--|---|--|---|
| FS1 | <p>How do people grow? X2 sessions How does your garden grow? X4 sessions Whose baby is that? X4 sessions</p> | | <p>Everyday Materials Where does my food come from? X4 sessions Are all materials the same? X4 sessions</p> | <p>Seasonal Change <i>Daily weather watch</i></p> | | |
| FS2 | <p>Are all animals the same? X6 sessions Can we grow a beanstalk? X6 sessions How do I stay healthy? X4 sessions</p> | | <p>Everyday Materials How does my food change? X6 sessions Which material will be strong enough? X6 sessions</p> | <p>Seasonal Change <i>Daily weather watch</i></p> | | |
| Y1 | <p>Animals, including Humans Which class would an elephant be in? X12 sessions</p> <ul style="list-style-type: none"> Classifying Testing | <p>Plants Do trees have petals? X12 sessions</p> <ul style="list-style-type: none"> Observing Questioning | <p>Everyday Materials Which material would be best for a castle? X12 sessions</p> <ul style="list-style-type: none"> Answering Classifying | <p>Seasonal Change ongoing throughout the year & Geography (floor book)</p> <ul style="list-style-type: none"> Data | | |
| Y2 | <p>Living things and their habitats Can all animals live in Yorkshire? X9 sessions</p> <ul style="list-style-type: none"> Classifying Questioning | <p>Animals, including Humans Are we healthy enough to be astronauts? X9 sessions</p> <ul style="list-style-type: none"> Observing Classifying Questioning | <p>Plants Why do the seeds in my packet not grow? X9 sessions</p> <ul style="list-style-type: none"> Answering Testing | <p>Everyday Materials Why are our houses not made from mud? X9 sessions</p> <ul style="list-style-type: none"> Testing Data | | |
| Y3 | <p>Animals, including humans Does your funny bone make you laugh? X6 sessions</p> <ul style="list-style-type: none"> Questioning Observing Data | <p>Plants Do You Have Flower Power? X6 sessions</p> <ul style="list-style-type: none"> Testing Observing Patterns | <p>Rocks What do rocks tell us about how Earth was formed? X6 sessions</p> <ul style="list-style-type: none"> Concluding Data | <p>Forces and Magnets What is your 'Forces Superhero'? X6 sessions</p> <ul style="list-style-type: none"> Questioning Recording | <p>Light How far can you throw your shadow? X6 sessions</p> <ul style="list-style-type: none"> Questioning Patterns Using Evidence | |
| Y4 | <p>Animals, including humans Why do we poo? X6 sessions</p> <ul style="list-style-type: none"> Questioning Observing Data | <p>Living things and their habitats Where have all the hedgehogs gone? X6 sessions</p> <ul style="list-style-type: none"> Patterns Recording Data | <p>States of Matter How can water be a solid, a liquid and a gas? X6 sessions</p> <ul style="list-style-type: none"> Testing Observing Data Reporting | <p>Electricity How is electricity shocking? X6 sessions</p> <ul style="list-style-type: none"> Concluding Using Evidence | <p>Sound What caused that racket? X6 sessions</p> <ul style="list-style-type: none"> Testing Patterns Using Evidence | |
| Y5 | <p>Living things and their habitats Do all living things start life as an egg? X6 sessions</p> <ul style="list-style-type: none"> Observing and Measuring Reporting and Presenting Identifying Evidence | <p>Animals, including humans How different will you be when you're as old as the Queen? X6 sessions</p> <ul style="list-style-type: none"> Questioning and Testing Recording Identifying Evidence | <p>Properties and changes in materials How can matter change its state? X6 sessions</p> <ul style="list-style-type: none"> Questioning and Testing Observing and Measuring Recording | <p>Forces Can you feel the force? X6 sessions</p> <ul style="list-style-type: none"> Questioning and Testing Observing and Measuring Predicting | <p>Earth and Space Will we ever send another human to the moon? X6 sessions</p> <ul style="list-style-type: none"> Predicting Reporting and Presenting | |
| Y6 | <p>Animals, including humans What would a journey through your body look like? X6 sessions</p> <ul style="list-style-type: none"> Questioning and Testing Observing and Measuring Reporting and Presenting | <p>Living things and their habitats How would you be classified? X6 sessions</p> <ul style="list-style-type: none"> Observing and Measuring Predicting Identifying Evidence | <p>Evolution and Inheritance Have we always looked like this? X6 sessions</p> <ul style="list-style-type: none"> Recording Identifying Evidence | | <p>Electricity Do you have the power to light up the dark? X6 sessions</p> <ul style="list-style-type: none"> Questioning and Testing Reporting and Presenting Recording | <p>Light Can you see the light? X6 sessions</p> <ul style="list-style-type: none"> Predicting Identifying Evidence |

Science: Early Years Foundation Stage

| | | 30-50m | 40-60m | ELG/Exceeding |
|---|--|---|--|---|
| <p>ELG: The World Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.</p> <p>New 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.</p> | <p>Working Scientifically</p> | <p>FS1 ACE Questions How do people grow? How does your garden grow? Whose baby is that? Where does my food come from? Are all materials the same?</p> <ul style="list-style-type: none"> Notice and observe details in objects and their environment Make comments about what they have observed Begin to ask questions about things they have observed Show curiosity in their immediate environment | <p>FS2 ACE Questions Are all animals the same? Can we grow a beanstalk? Which material will be strong enough? How does my food change? How do I stay healthy?</p> <ul style="list-style-type: none"> Look closely at change Talk about what they have observed Ask questions about things they have observed Show curiosity in the world around them <p>FS2 ACE Questions Are all animals the same? Can we grow a beanstalk?</p> <ul style="list-style-type: none"> Look closely at similarities Look closely at differences <p>FS2 ACE Questions Are all animals the same? How does my food change? Weather</p> <ul style="list-style-type: none"> Classify by grouping and sorting using given criteria Look closely at patterns - weather | <p>FS2 ACE Questions Are all animals the same? Can we grow a beanstalk? Which material will be strong enough? How does my food change? How do I stay healthy?</p> <ul style="list-style-type: none"> Talk about patterns and changes they have observed or read about in class Explain what they have noticed in their observations Explain why changes may occur Ask questions about things they have observed or read about in class <p>FS2 ACE Questions Are all animals the same? Can we grow a beanstalk?</p> <ul style="list-style-type: none"> Talk about similarities and differences they have observed or read about in class <p>FS2 ACE Questions Are all animals the same? How does my food change?</p> <ul style="list-style-type: none"> Explain how they have classified and sorted using their own criteria- materials / animals |
| | <p>Animals including humans</p> | <p>FS1 ACE Question How do people grow?</p> <ul style="list-style-type: none"> Know that baby animals, including humans, grow into adult animals Know the names of some external human body parts <i>(see vocabulary below to specify)</i> <p>FS1 ACE Question Whose baby is that?</p> <ul style="list-style-type: none"> Know the names of a variety of animals <i>(see vocabulary below to specify)</i> Know that baby animals, including humans, grow into adult animals Know the names of some animal babies <i>(see vocabulary below to specify)</i> Know that animals need to be cared for / respected (pets, farm animals, insects) <p><i>Animals: human, cat, dog, cow, pig, chicken, fish, bird, snake, tiger, elephant, monkey,</i> <i>Animal babies: baby, kitten, puppy, calf, piglet, chick</i> <i>Human body parts: - head, body, arms, legs, feet, shoulders, knees, toes, eyes, ears, mouth, nose grow, care, pet</i></p> | <p>FS2 ACE Questions Are all animals the same?</p> <ul style="list-style-type: none"> Know where some different animals live <i>(fish, giraffe, cow, human, hedgehog, owl, polar bear)</i> Know the names of some different animals' external body parts. <i>(see vocabulary below to specify)</i> Know how different animals may move in different ways <i>(swim, walk, hop, run, crawl, fly)</i> Know that animals grow and change over time <i>(chicks hatching, frogspawn and caterpillars transforming)</i> <p>FS2 ACE Questions How do I stay healthy?</p> <ul style="list-style-type: none"> Know what humans need to do to keep healthy <i>(eat healthy foods, keep clean including brush our teeth, sleep and exercise)</i> <p><i>Animals: giraffe, human, hedgehog, owl, polar bear</i> <i>Animal habitats: sea, jungle, farm, house, garden, forest, arctic</i> <i>Animal body parts: head, body, legs, ears, wings, beak, fins, tail, claws, paws, fur, neck swim, fly, walk, hop, crawl, change, egg, chick, hatch, frogspawn, tadpole, caterpillar, cocoon, butterfly, life cycle</i> <i>healthy, same, different</i></p> | <p>FS2 ACE Questions Are all animals the same?</p> <ul style="list-style-type: none"> Know why certain animals are suited to living in the habitats they do <i>(e.g. fish, sea, fins; polar bear, arctic, fur; giraffe, jungle, long neck)</i> Know the basic life cycle of different animals <i>(chicken, frog, butterfly)</i> <p>FS2 ACE Questions How do I stay healthy?</p> <ul style="list-style-type: none"> Know some foods which are healthy and some which are less healthy <p><i>see 40-60 plus features, habitat, healthy</i></p> |

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|--|---|--|--|--|
| | Plants | <p>FS1 ACE Question How does your garden grow?</p> <ul style="list-style-type: none"> Know that plants change over time e.g. grow taller, flowers wilt, leaves fall off. Know that not all plants look the same Knows that plants need to be cared for Know that the fruits and vegetables we eat are parts of plants Know the names of some common fruits and vegetables that we eat (<i>see vocabulary below to specify</i>) | <p>FS2 ACE Question Can we grow a beanstalk?</p> <ul style="list-style-type: none"> Know there are similarities and differences between different types of plants Know the names of some common plants/flowers (<i>see vocabulary below to specify</i>) Know that plants grow from seeds or bulbs in the ground | <p>FS2 ACE Question Can we grow a beanstalk?</p> <ul style="list-style-type: none"> Know what effect the changing seasons have on plants and trees Know that different environments have different plants growing there (desert, woodland, rainforest) Know that plants need soil, water and light to grow Know the name of some of the parts of a plant (<i>see vocabulary below to specify</i>) |
| | | <p><i>grow, same, different, care, garden, plants, flowers</i> Fruit and vegetables: <i>apple, grapes, strawberries, broad beans, tomatoes, carrots</i></p> | <p>Plants / flowers: <i>daisy, buttercup, daffodil, sunflower, poppy, bluebell, cress, ivy, beanstalk, grass</i> <i>same, different, seed, bulb,</i></p> | <p><i>plant, soil, pot, water, sunlight</i> <i>roots, leaves, stem, flower</i></p> |
| | Everyday Materials Including food | <p>FS1 ACE Question Where does my food come from?</p> <ul style="list-style-type: none"> Know that animals provide food (<i>cow - milk, chicken - eggs, cow - meat</i>) <p>FS1 ACE Question Are all materials the same?</p> <ul style="list-style-type: none"> Know the meaning of some words used to name materials - wood, fabric, metal, plastic (matching) Know the meaning of some words used to describe materials - hard, soft, rough, smooth (matching) | <p>FS2 ACE Question Which material will be strong enough?</p> <p>FS2 ACE Question How does my food change?</p> <ul style="list-style-type: none"> Know how to compare similarities and differences between materials (sorting) Know the names of some common materials - (<i>see vocabulary below to specify</i>) Know some common vocabulary used to describe materials - (<i>see vocabulary below to specify</i>) | <p>FS2 ACE Question Which material will be strong enough?</p> <ul style="list-style-type: none"> Know how to observe whether materials float or sink Know how to observe whether materials are magnetic or not magnetic <p>FS2 ACE Question How does my food change?</p> <ul style="list-style-type: none"> Knows ways that some materials can change over time (<i>water freezing, ice melting, apple decaying, jelly setting, buns baking, pasta cooking, wood burning</i>) |
| <p><i>milk, eggs, meat, animals, cow, chicken, plants, tomatoes, farm, shop,</i> Know the meaning of - <i>wood, fabric, metal, plastic, hard, soft, rough, smooth</i> <i>material, same</i></p> | | <p><i>similarities, differences</i> <i>wood, fabric, metal, plastic</i> <i>hard, soft, rough, smooth</i></p> | <p><i>float, sink, magnetic</i> <i>change, freeze, melt, decay, wrinkle, set, liquid, solid, bake, cook, burn</i></p> | |
| Weather and Seasons | <p>Ongoing throughout the year</p> <ul style="list-style-type: none"> Know the names of some types of British weather (<i>see vocabulary below to specify</i>) Know when they themselves feel hot Know when they themselves feel cold | <p>Ongoing throughout the year</p> <ul style="list-style-type: none"> Know how to identify and name different types of weather (<i>see vocabulary below to specify</i>) Know which clothing is appropriate to wear in which type of weather (<i>see vocabulary below to specify</i>) Know the names of the British seasons | <p>Ongoing throughout the year</p> <ul style="list-style-type: none"> Knows what effect the changing seasons have on their environment (how the trees change) Know the typical weather types associated with each British season: Summer - warm, sunny; Autumn - cool, windy; Winter - cold, icy, snow; Spring - cool, rainy, sunny Know some typical activities suitable for each weather type e.g. sunny - beach, picnic; windy - fly a kite; snow - make a snowman, go sledging, have a snowball fight; rain - use an umbrella, splash in puddles | |
| | <p><i>weather, hot, cold, rain, sun, snow, wind</i></p> | <p>Weather: <i>warm, sunny, cool, windy, cold, icy, snowy, rainy, foggy, wet, cloudy</i> Clothing: <i>wellies, coat, umbrella, sunhat, sunglasses, gloves, scarf, hat</i> <i>season, Spring, Summer, Autumn, Winter</i></p> | <p><i>change, compare</i></p> | |

Science: Year 1

Programme of Study: Working Scientifically - Years 1 and 2

These opportunities for working scientifically should be provided across years 1 and 2 so that the expectations in the PoS can be met by the end of Y2. Pupils are not expected to cover each aspect for every area of study.
 highlighted text indicates new skills to be introduced in Year 1 (unhighlighted indicates skills to be introduced in Year 2)

| | Questioning: asking simple questions and recognising that they can be answered in different ways | Observing: observing closely, using simple equipment | Testing: performing simple tests | Classifying: identifying and classifying | Answering: using their observations and ideas to suggest answers to questions | Data: gathering and recording data to help in answering questions. |
|---|--|--|--|--|---|---|
| <p>During Y1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content. Pupils are not expected to cover each aspect for every area of study.</p> | <ul style="list-style-type: none"> explore the world around them, leading them to ask some simple scientific questions about how and why things happen; begin to recognise ways in which they might answer scientific questions; ask people questions and use simple secondary sources to find answers. | <ul style="list-style-type: none"> observe the natural and humanly constructed world around them; observe changes over time; use simple measurements and equipment; make careful observations, sometimes using equipment to help them observe carefully. | <ul style="list-style-type: none"> carry out simple practical tests, using simple equipment; experience different types of scientific enquiries, including practical activities; talk about the aim of scientific tests they are working on; with support, start to recognise a fair test. | <ul style="list-style-type: none"> use simple features to compare objects, materials and living things; decide how to sort and classify objects into simple groups with some help; record and communicate findings in a range of ways with support; | <ul style="list-style-type: none"> notice links between cause and effect with support; begin to notice patterns and relationships with support; begin to draw simple conclusions; identify and discuss differences between their results; | <ul style="list-style-type: none"> sort, group, gather and record data in a variety of ways to help in answering questions such as in simple sorting diagrams, pictograms, tally charts, block diagrams and simple tables. |

Programme of Study: Content

| | Biology | | Chemistry | Physics |
|---------------------|--|--|--|---|
| | Animals, including Humans ACE Question: Which class would an elephant be in? | Plants ACE Question: Do trees have petals? | Everyday Materials ACE Question: Which material would be best for a castle? | Seasonal Change ACE Question: ongoing throughout the year (floor book) |
| National Curriculum | <ul style="list-style-type: none"> 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) identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense | <ul style="list-style-type: none"> identify and name a variety of common wild and garden plants, including deciduous and evergreen trees identify and describe the basic structure of a variety of common flowering plants, including trees | <ul style="list-style-type: none"> distinguish between an object and the material from which it is made identify and name a variety of everyday materials, incl wood, plastic, glass, metal, water, and rock describe the simple physical properties of a variety of everyday materials compare and group together a variety of everyday materials on the basis of their simple physical properties. | <ul style="list-style-type: none"> observe changes across the four seasons observe and describe weather associated with the seasons and how day length varies. |
| Sticky knowledge | <ul style="list-style-type: none"> Know the names and classification of a range of animals which are amphibian, reptile, mammal, fish or bird. (vocabulary below specifies) Know the names of three animals which are carnivore, herbivore or omnivore (vocabulary below specifies) Know how to sort by living and non-living things Know the names of parts of the human body that can be seen (vocabulary below specifies) | <ul style="list-style-type: none"> Know and name a variety of common wild and garden plants (vocabulary below specifies) Know the name of the parts of plants - petals, stem, leaves, flowers and root Know the name of the parts of a tree - roots, trunk, branches and leaves | <ul style="list-style-type: none"> Know the name of the materials objects are made from (vocabulary below specifies) Know about the properties of everyday materials (vocabulary below specifies) Know how to sort materials by property | <ul style="list-style-type: none"> Name the seasons and know about the type of weather in each season (Geography links 'Can we be weather watchers?' - seasonal DLD / session) |

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|------------------------------|--|---|---|--|
| Vocabulary | <ul style="list-style-type: none"> • Fish: goldfish, tuna, shark, eel • Reptiles: snake, tortoise, lizard, alligator • Mammals: human, mouse, dog, cow • Birds: penguin, chicken, seagull, robin • Amphibians: frog, toad, newt salamander • Herbivore: tortoise, cow, koalas, horse, sheep, worm • Omnivore: goldfish, human, mouse, dog, chicken, robin • Carnivore: tuna, shark, eel, snake, lizard, alligator, penguin, seagull, frog, toad, newt, salamander • Eyes, eyebrows, eyelashes, ears, ear lobes, nose, nostrils, mouth, lips, teeth, tongue, hands, fingers, wrists, elbows, legs, knees, ankles, feet, toes, waist, chest, shoulders, neck | <ul style="list-style-type: none"> • Wild: dandelion, daisy, buttercup, nettles, ivy, clover, brambles • Garden: fuchsia, pansy, sweet pea, sunflower, daffodil, rose, lavender, iris • Deciduous trees: beech, sycamore, oak • Evergreen trees: holly, conifers, yew • Petals, Stem, Leaves, Roots, Flowers • Roots, Trunk, Branches, Leaves, (Blossom, Fruit) | <ul style="list-style-type: none"> • Wood, Plastic, Glass, Paper, Water, Metal, Rock • Hard, Soft, Bendy, Rough, Smooth, Stretchy, See-through/ Transparent, Waterproof, Squashy, Rigid, Flexible | <ul style="list-style-type: none"> • Summer, Spring, Autumn, Winter • Hot, warm, cool, cold, sunny, rainy, windy, snowy, icy, frosty • Sun, Day, Moon, Night, Light, Dark |
| Useful References/ Resources | https://www.twinkl.co.uk/resource/tp-sc-029-planit-science-year-1-animals-including-humans-unit-pack https://www.bbc.co.uk/bitesize/topics/z6882hv/articles/zp92xnb https://www.bbc.co.uk/bitesize/topics/z6882hv/articles/zc6br82 https://www.bbc.co.uk/bitesize/topics/z6882hv/articles/zvd6hvc https://www.bbc.co.uk/bitesize/topics/z6882hv/articles/zxgq2hv https://www.bbc.co.uk/bitesize/topics/z6882hv/articles/zp9pfg8 https://www.bbc.co.uk/bitesize/topics/z9yycdm/articles/zqhr82 https://www.bbc.co.uk/bitesize/topics/z9yycdm/articles/zxy987h | https://www.twinkl.co.uk/resource/t2-sc-009-planit-science-year-1-plants-unit-pack https://www.bbc.co.uk/bitesize/topics/zpxnyrd/articles/z3wpsbk https://www.bbc.co.uk/bitesize/topics/zpxnyrd/articles/zw2y34j | https://www.twinkl.co.uk/resource/tp-sc-031-planit-science-year-1-everyday-materials-unit-pack | https://www.twinkl.co.uk/resource/tp-sc-116-planit-science-year-1-seasonal-changes-spring-and-summer-unit-pack https://www.twinkl.co.uk/resource/tp-sc-080-new-planit-science-year-1-seasonal-changes-autumn-and-winter-unit-pack https://www.bbc.co.uk/bitesize/topics/zkv4wx/articles/zcx3gk7 https://www.bbc.co.uk/bitesize/topics/zkv4wx/articles/ztdnyrd |

Year 1 Enquiry types

| | | | | |
|-------------------------------------|---|---|---|---|
| Observing Over Time | How does my height change over the year? (half termly, with photos) | How does my <u>sunflower</u> change each week? | | |
| Pattern Seeking | | | Is there a pattern in the types of materials that are used to make objects in our school? | Does the wind always blow the same way? |
| Identifying & Classifying | How can we organise all of the animals? What are the names for all of the parts of our body? | | Which materials are waterproof? | How would you group these things, based on which season you are most likely to see them in? |
| Comparative Tests | Is our sense of smell better when we can't see? | Which tree has the biggest leaves? | | |
| Researching using Secondary Sources | | What are the most common British plants and where can we find them? | Which materials can be recycled? How are bricks made? | |

Science: Year 2

Programme of Study: Working Scientifically - Years 1 and 2

These opportunities for working scientifically should be provided across years 1 and 2 so that the expectations in the PoS can be met by the end of Y2. Pupils are not expected to cover each aspect for every area of study.
 highlighted text indicates new skills to be introduced in Year 2 (unhighlighted indicates skills previously introduced in Year 1)

| | | | | | | |
|---|--|--|--|--|---|---|
| During Years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content. Pupils are not expected to cover each aspect for every area of study. | Questioning: asking simple questions and recognising that they can be answered in different ways | Observing: observing closely, using simple equipment | Testing: performing simple tests | Classifying: identifying and classifying | Answering: using their observations and ideas to suggest answers to questions | Data: gathering and recording data to help in answering questions. |
| | <ul style="list-style-type: none"> explore the world around them, leading them to ask some simple scientific questions about how and why things happen; begin to recognise ways in which they might answer scientific questions; ask people questions and use simple secondary sources to find answers. | <ul style="list-style-type: none"> observe the natural and humanly constructed world around them; observe changes over time; use simple measurements and equipment; make careful observations, sometimes using equipment to help them observe carefully. | <ul style="list-style-type: none"> carry out simple practical tests, using simple equipment; experience different types of scientific enquiries, including practical activities; talk about the aim of scientific tests they are working on; with support, start to recognise a fair test. | <ul style="list-style-type: none"> use simple features to compare objects, materials and living things; decide how to sort and classify objects into simple groups with some help; record and communicate findings in a range of ways with support; | <ul style="list-style-type: none"> notice links between cause and effect with support; begin to notice patterns and relationships with support; begin to draw simple conclusions; identify and discuss differences between their results; | <ul style="list-style-type: none"> sort, group, gather and record data in a variety of ways to help in answering questions such as in simple sorting diagrams, pictograms, tally charts, block diagrams and simple tables. |

Programme of Study: Content

| | Biology | | | Chemistry |
|----------------------------|---|--|--|--|
| | Living things and their habitats ACE Question: Can all animals live in Yorkshire? | Animals, including Humans ACE Question: Are we healthy enough to be astronauts? | Plants ACE Question: Why do the seeds in my packet not grow? | Everyday Materials ACE Question: Why are our houses not made from mud? |
| National Curriculum | <ul style="list-style-type: none"> explore and compare the differences between things that are living, dead, and things that 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 animals in their habitats, including microhabitats 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. | <ul style="list-style-type: none"> notice that animals, including humans, have offspring which grow into adults find out about and describe the basic needs of animals, incl humans, for survival (water, food and air) describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. | <ul style="list-style-type: none"> 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. identify and name a variety of plants in their habitats, incl microhabitats | <ul style="list-style-type: none"> identify and compare the suitability of a variety of everyday materials, incl wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching |
| Sticky knowledge | <ul style="list-style-type: none"> Classify things by living, dead or never lived Know how a specific habitat provides for the basic needs of things living there (plants and animals) Match living things to their habitat Name some of the different sources of food for animals Know about and explain a simple food chain | <ul style="list-style-type: none"> Know the basic stages in a life cycle for animals, (including humans) Know why exercise, a balanced diet and good hygiene are important for humans | <ul style="list-style-type: none"> Know and explain how seeds and bulbs grow into plants Know what plants need in order to grow and stay healthy (water, light & suitable temperature) | <ul style="list-style-type: none"> Know how materials can be changed by squashing, bending, twisting and stretching Know why a material might or might not be used for a specific job |
| Vocabulary | <ul style="list-style-type: none"> Living, Dead, Habitat, Energy, Food chain, Predator, Prey, Source Woodland, Pond, Desert | <ul style="list-style-type: none"> Survival, Water, Air, Food, Born, Offspring, Young, Old, Baby, Toddler, Child, Teenager, Adult, Senior | <ul style="list-style-type: none"> Seeds, Bulbs, Seed Case, Germinate, Roots, Shoots, cress, runner bean, lily (plant lilies early spring 30-45 days before they will shoot) | <ul style="list-style-type: none"> Hard, Soft, Stretchy, Stiff, Rigid, Shiny, Dull, Rough, Smooth, Bendy, Waterproof, Absorbent, Opaque, Transparent |

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| | | <ul style="list-style-type: none"> • <i>Kitten (cat), Puppy (dog), Calf (cow, elephant, dolphin), Lamb (sheep), Kid (goat), Foal (horse), Cub (tiger, lion, bear, fox) Snakelet (snake)</i> • <i>Exercise, Hygiene, Balanced Diet</i> | <ul style="list-style-type: none"> • <i>Water, Light, Temperature, Growth</i> | <ul style="list-style-type: none"> • <i>Wood, Metal, Plastic, Glass, Brick, Rock, Paper, Cardboard, Fabric</i> • <i>Squashing, Bending, Twisting, Stretching, Elastic, Foil</i> |
| Useful References/ Resources | https://www.twinkl.co.uk/resource/tp-sc-050-planit-science-year-2-living-things-and-their-habitats-unit-pack https://www.bbc.co.uk/bitesize/topics/z6882hv/articles/z96vb9g https://www.bbc.co.uk/bitesize/topics/z6882hv/articles/zx38wmn https://www.bbc.co.uk/bitesize/topics/zx882hv/articles/z3c2xnb | https://www.twinkl.co.uk/resource/tp-sc-105-planit-science-year-2-animals-including-humans-unit-pack https://www.bbc.co.uk/bitesize/topics/z6882hv/articles/zttckqt https://www.bbc.co.uk/bitesize/topics/z9vyvcdm/articles/zxvkd2p | https://www.twinkl.co.uk/resource/tp-sc-019-planit-science-year-2-plants-unit-pack https://www.bbc.co.uk/bitesize/topics/zpxnyrd/articles/zxxsyrd https://www.bbc.co.uk/bitesize/topics/zpxnyrd/articles/z2vdjx5 | https://www.twinkl.co.uk/resource/tp-sc-60-planit-science-y2-uses-of-everyday-materials-unit-pack https://www.bbc.co.uk/bitesize/topics/zrsgk7/articles/z9pgcdm |

Year 2 Enquiry Types

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|-------------------------------------|---|--|---|--|
| Observing Over Time | | How much food and drink do I have over a week? | What happens to my (specify) seed after it has been planted? | |
| Pattern Seeking | | | Do bigger seeds grow into bigger plants? | |
| Identifying & Classifying | How would you group these plants and animals based on what habitat you would find them in? How do we group things to show which are dead, living, never been alive? | Which babies belong to which animal? | How can we identify the seeds/plants? | Which ball is the bounciest? |
| Comparative Tests | | | Do cross seeds grow quicker inside or outside? | Which material would be the best for...? |
| Researching using Secondary Sources | What do you need to do to look after a shark at The Deep and keep it healthy? How does the habitat the Kenyan Savannah compare to the woodlands of England? | What food do you need in a healthy diet and why? | | |

Science: Year 3

Programme of Study: Working Scientifically - Years 3 and 4

These opportunities for working scientifically should be provided across years 3 and 4 so that the expectations in the PoS can be met by the end of Y4. Pupils are not expected to cover each aspect for every area of study.
 highlighted text indicates new skills to be introduced in Year 3 (unhighlighted indicates skills to be a focus in Y4)

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|---|--|--|--|---|---|--|---|--|--|
| During Years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content. Pupils are not expected to cover each aspect for every area of study. | Questioning: asking relevant questions and using different types of scientific enquiries to answer them | Testing: setting up simple practical enquiries, comparative and fair tests | Observing: making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers | Data: gathering, recording, classifying and presenting data in a variety of ways to help in answering questions | Recording: recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables | Reporting: reporting on findings from enquiries, incl oral and written explanations, displays or presentations of results & conclusions | Concluding: using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions | Patterns: identifying differences, similarities or changes related to simple scientific ideas and processes | Using Evidence: using straight forward scientific evidence to answer questions or to support their findings. |
| | <ul style="list-style-type: none"> start to raise their own relevant questions about the world around them in response to a range of scientific experiences; start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; | <ul style="list-style-type: none"> recognise when a fair test is necessary; help decide how to set up a fair test, making decisions about what observations to make, how long to make them for and the type of simple equipment that might be used; set up and carry out simple comparative and fair tests. | <ul style="list-style-type: none"> make systematic and careful observations; observe changes over time; use a range of equipment, including thermometers and data loggers; ask their own questions about what they observe; where appropriate, take accurate measurements using standard units using a range of equipment. | <ul style="list-style-type: none"> talk about criteria for grouping, sorting and classifying; group and classify things; collect data from their own observations and measurements; present data in a variety of ways to help in answering questions; | <ul style="list-style-type: none"> use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge; record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. | <ul style="list-style-type: none"> first talk about, and then go on to write about, what they have found out; report and present their results and conclusions to others in written and oral forms with increasing confidence. | <ul style="list-style-type: none"> draw simple conclusions from their results; make predictions; suggest improvements to investigations; raise further questions which could be investigated; | <ul style="list-style-type: none"> identify similarities, differences, patterns and changes relating to simple scientific ideas and processes; make links between their own science results and other scientific evidence; | <ul style="list-style-type: none"> use straightforward scientific evidence to answer questions or support their findings; recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations. |

Programme of Study: Content

| | Biology | | Chemistry | Physics | |
|---------------------|--|--|--|---|--|
| | Animals, incl humans ACE Question: Does your funny-bone make you laugh? | Plants ACE Question: Do You Have Flower Power? | Rocks ACE Question: What do rocks tell us about how Earth was formed? | Forces and Magnets ACE Question: What is your 'Forces Superhero'? | Light ACE Question: How far can you throw your shadow? |
| National Curriculum | <ul style="list-style-type: none"> identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat identify that humans and some other animals have skeletons and | <ul style="list-style-type: none"> identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers 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 | <ul style="list-style-type: none"> compare and group together different kinds of rocks on the basis of their appearance and simple physical properties describe in simple terms how fossils are formed when things that have lived are trapped within rock | <ul style="list-style-type: none"> compare how things move on different surfaces notice that some forces need contact between two objects, but magnetic forces can act at a distance observe how magnets attract or repel each other and attract some materials and not others | <ul style="list-style-type: none"> 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 an opaque object |

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| | <i>muscles for support, protection and movement.</i> | <ul style="list-style-type: none"> 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. | <ul style="list-style-type: none"> recognise that soils are made from rocks and organic matter. | <ul style="list-style-type: none"> 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 two poles predict whether two magnets will attract or repel each other, depending on which poles are facing. | <ul style="list-style-type: none"> find patterns in the way that the size of shadows change. |
| Sticky knowledge | <ul style="list-style-type: none"> Know about the importance of a nutritious, balanced diet Know about the skeletal and muscular system of a human | <ul style="list-style-type: none"> Know the function of different parts of flowering plants and trees Know how water is transported within plants Know the plant life cycle, especially the importance of flowers | <ul style="list-style-type: none"> Compare and group rocks based on their appearance and physical properties, giving reasons Know how soil is made and how fossils are formed Know about and explain the difference between sedimentary, metamorphic and igneous rock | <ul style="list-style-type: none"> Know about and describe how objects move on different surfaces Know how a simple pulley works and use to on to lift an object Know how some forces require contact and some do not, giving examples Know about and explain how magnets attract and repel Predict whether magnets will attract or repel and give a reason | <ul style="list-style-type: none"> Know that dark is the absence of light Know that light is needed in order to see and is reflected from a surface Know and demonstrate how a shadow is formed and explain how a shadow changes shape Know about the danger of direct sunlight and describe how to keep protected |
| Vocabulary | <ul style="list-style-type: none"> <i>Nutrition, Nutritious, Balanced Diet, Carbohydrate, Protein, Fats, Sugar, Vitamins</i> <i>Movement, Muscles, Bones, Skull, Skeletons,</i> | <ul style="list-style-type: none"> <i>Air, Light, Water, Nutrients, Soil, Reproduction, Transportation, Dispersal, Pollination, Flower, Germination</i> | <ul style="list-style-type: none"> <i>Fossils, Soils, Sandstone, Granite, Marble, Pumice, Crystals, Absorbent, Sedimentary, Metamorphic, Igneous</i> | <ul style="list-style-type: none"> <i>Magnetic, Force, Contact, Attract, Repel, Friction, Poles, Push, Pull</i> | <ul style="list-style-type: none"> <i>Light, Shadows, Mirror, Reflective, Dark, Reflection</i> |
| Useful References / Resources | https://www.twinkl.co.uk/resource/tp2-s-022-planit-science-year-3-animals-including-humans-unit-pack https://www.bbc.co.uk/bitesize/topics/z9339j6 https://www.bbc.co.uk/bitesize/topics/zrffr82 | https://www.twinkl.co.uk/resource/tp2-s-023-planit-science-year-3-plants-unit-pack https://www.bbc.co.uk/bitesize/topics/zy66fg8 | https://www.twinkl.co.uk/resource/tp2-s-158-planit-science-year-3-rocks-unit-pack https://www.bbc.co.uk/bitesize/topics/z9bbkat | https://www.twinkl.co.uk/resource/tp2-s-157-planit-science-year-3-forces-and-magnets-unit-pack https://www.bbc.co.uk/bitesize/topics/zyvpp34j/articles/zywcrdm https://www.bbc.co.uk/bitesize/topics/zyttyrd | https://www.twinkl.co.uk/resource/tp2-s-122-planit-science-year-3-light-unit-pack https://www.bbc.co.uk/bitesize/topics/zbssgk7 |
| Year 3 Enquiry Type | | | | | |
| Observing Over Time | | How do flowers in a vase change over time? | | | How do our shadows change over time? |
| Pattern Seeking | Do male humans have larger skulls than females? | | Is there a pattern in where we find volcanoes? | | |
| Identifying & Classifying | How can we group the food we eat? | | Can you use the identification key to find out the names of each of the rocks? | Which materials are magnetic? | |
| Fair and Comparative Tests | | How does the length of the carnation stem affect how long it takes for the food colouring to dye the petals? (F) | | Which magnet is the strongest? | How does the distance between the shadow puppet and the screen affect the size of the shadow? |
| Researching using Secondary Sources | Why do different types of vitamins keep us healthy? Which foods can we find them in? | What are all the different ways that seeds disperse? | | | |

Science: Year 4

Programme of Study: Working Scientifically - Years 3 and 4

These opportunities for working scientifically should be provided across years 3 and 4 so that the expectations in the PoS can be met by the end of Y4. Pupils are not expected to cover each aspect for every area of study.
 highlighted text indicates new skills to be introduced in Year 4 (unhighlighted indicates previously introduced in Year 3)

| | Questioning: asking relevant questions and using different types of scientific enquiries to answer them | Testing: setting up simple practical enquiries, comparative and fair tests | Observing: making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers | Data: gathering, recording, classifying and presenting data in a variety of ways to help in answering questions | Recording: recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables | Reporting: reporting on findings from enquiries, incl oral and written explanations, displays or presentations of results & conclusions | Concluding: using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions | Patterns: identifying differences, similarities or changes related to simple scientific ideas and processes | Using Evidence: using straight forward scientific evidence to answer questions or to support their findings. |
|--|--|--|---|---|---|--|---|--|--|
| <p>During Years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content. Pupils are not expected to cover each aspect for every area of study.</p> | <ul style="list-style-type: none"> start to raise their own relevant questions about the world around them in response to a range of scientific experiences; start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; | <ul style="list-style-type: none"> recognise when a fair test is necessary; help decide how to set up a fair test, making decisions about what observations to make, how long to make them for and the type of simple equipment that might be used; set up and carry out simple comparative and fair tests. | <ul style="list-style-type: none"> make systematic and careful observations; observe changes over time; use a range of equipment, including thermometers and data loggers; ask their own questions about what they observe; where appropriate, take accurate measurements using standard units using a range of equipment. | <ul style="list-style-type: none"> talk about criteria for grouping, sorting and classifying; group and classify things; collect data from their own observations and measurements; present data in a variety of ways to help in answering questions; | <ul style="list-style-type: none"> use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge; record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. | <ul style="list-style-type: none"> first talk about, and then go on to write about, what they have found out; report and present their results and conclusions to others in written and oral forms with increasing confidence. | <ul style="list-style-type: none"> draw simple conclusions from their results; make predictions; suggest improvements to investigations; raise further questions which could be investigated; | <ul style="list-style-type: none"> identify similarities, differences, patterns and changes relating to simple scientific ideas and processes; make links between their own science results and other scientific evidence; | <ul style="list-style-type: none"> use straightforward scientific evidence to answer questions or support their findings; recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations. |

Programme of Study: Content

| | Biology | | Chemistry | Physics | |
|----------------------------|---|--|--|---|---|
| | Animals, including humans ACE Question: Why do we poo? | Living things and their habitats ACE Question: Where have all the hedgehogs gone? | States of Matter ACE Question: How can water be a solid, a liquid and a gas? | Electricity ACE Question: How is electricity shocking? | Sound ACE Question: What caused that racket? |
| National Curriculum | <ul style="list-style-type: none"> 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 Construct and interpret a variety of food chains, identifying producers, predators and prey | <ul style="list-style-type: none"> Recognise that living things can be grouped in a variety of ways Explore and use classification keys to group, identify and name living things in their local and wider environment Recognise that environments can change and that this can sometimes pose dangers to living things | <ul style="list-style-type: none"> Compare and group materials together, according to whether they are solids, liquids or gases Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius Identify the part played by evaporation and condensation in the water cycle and | <ul style="list-style-type: none"> Identify common appliances that run on electricity Construct a series 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 | <ul style="list-style-type: none"> Identify how sounds are made, associating some of them with something vibrating Recognise that vibrations from sounds travel through a medium to the ear Find patterns between the volume of a sound and the strength of the vibrations that produced it. |

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| | | <ul style="list-style-type: none"> Construct and interpret a variety of food chains, identifying producers, predators and prey (from <i>Animals</i>, including humans) | <p>associate the rate of evaporation with temperature</p> | <ul style="list-style-type: none"> Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit Recognise some common conductors and insulators, and associate metals with being good conductors. | <ul style="list-style-type: none"> Recognise that sounds get fainter as the distance from the sound source increases. |
| Sticky knowledge | <ul style="list-style-type: none"> Identify and name the parts of the human digestive system Know the functions of the organs in the human digestive system Identify and know the different types of human teeth Know the functions of different human teeth Use and construct food chains to identify producers, predators and prey | <ul style="list-style-type: none"> Use classification keys to group, identify and name living things Know how changes to an environment could endanger living things Use and construct food chains to identify producers, predators and prey (from <i>Animals</i>, including humans) | <ul style="list-style-type: none"> Group materials based on their state of matter (solid, liquid, gas) Know the temperature at which materials change state Know about and explore how some materials can change state Know the part played by evaporation and condensation in the water cycle | <ul style="list-style-type: none"> Identify and name appliances that require electricity to function Construct a series circuit Identify and name the components in a series circuit (including cells, wires, bulbs, switches and buzzers) Predict and test whether a lamp will light within a circuit Know the function of a switch Know the difference between a conductor and an insulator; giving examples of each | <ul style="list-style-type: none"> Know how sound is made, associating some of them with vibrating Know how sound travels from a source to our ears Know the correlation between pitch and the object producing a sound Know the correlation between the volume of a sound and the strength of the vibrations that produced it Know what happens to a sound as it travels away from its source |
| Vocabulary | <ul style="list-style-type: none"> Mouth, Tongue, Teeth, Oesophagus, Stomach, Small Intestine, Large Intestine Herbivore, Carnivore, Canine, Incisor, Molar Producers, Predators, Prey | <ul style="list-style-type: none"> Classify, Vertebrates, Invertebrates, Fish, Birds, Amphibians, Reptiles, Mammals Snails, Slugs, Worms, Spiders, Insects Environment, Habitats Solid, Liquid, Gas | <ul style="list-style-type: none"> Solid, Liquid, Gas, Evaporation, Condensation, Particles, Temperature, Freezing, Heating | <ul style="list-style-type: none"> Cells, Wires, Bulbs / Lamps, Switches, Buzzers, Battery, Circuit, Series, Conductors, Insulators | <ul style="list-style-type: none"> Volume, Vibration, Wave, Pitch, Tone, Speaker |
| Useful References / Resources | https://www.twinkl.co.uk/resource/tp2-s-031-planit-science-year-4-animals-including-humans-unit-pack https://www.bbc.co.uk/bitesize/topics/z27kng8 https://www.bbc.co.uk/bitesize/topics/zbnnb9q | https://www.twinkl.co.uk/resource/tp2-s-193-planit-science-year-4-living-things-and-their-habitats-unit-pack https://www.bbc.co.uk/bitesize/topics/zp22pv4 | https://www.twinkl.co.uk/resource/tp2-s-061-planit-science-year-4-states-of-matter-unit-pack https://www.bbc.co.uk/bitesize/topics/zkkg87h | https://www.twinkl.co.uk/resource/tp2-s-134-new-planit-science-y4-electricity-unit-pack https://www.bbc.co.uk/bitesize/topics/z2882hv | https://www.twinkl.co.uk/resource/tp2-s-157-new-planit-science-y4-sound-unit-pack https://www.bbc.co.uk/bitesize/topics/zgffr82 |

Year 4 Enquiry Types

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| Observing Over Time | How does an eggshell change when it is left in cola? | | How does the mass of an ice cube change over time? | | |
| Pattern Seeking | | How have modern gardens affected bee population? | | | Is there a link between how loud it is in school and the time of day? |
| Identifying & Classifying | How can we organise teeth into groups? | Can we use classification keys to identify a range of animals? | Can you group these materials and objects into solids, liquids and gases? | | |
| Fair and Comparative Tests | | | How does the mass of a block of ice affect how long it takes to melt? (F) | Which metal is the best conductor for electricity? (C) | How does the volume of a drum change as you move further away from it? (F) |
| Researching using Secondary Sources | | | | How has electricity changed the way we live? | Do all animals have the same hearing range? |

Science: Year 5

Programme of Study: Working Scientifically - Years 5 and 6

These opportunities for working scientifically should be provided across years 5 and 6 so that the expectations in the PoS can be met by the end of Y6. Pupils are not expected to cover each aspect for every area of study.
 highlighted text indicates new skills to be introduced in Year 5 (unhighlighted indicates previously skills to be introduced in Year 6)

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|---|---|--|---|---|---|--|
| During Years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content. Pupils are not expected to cover each aspect for every area of study. | Questioning and Testing: planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary | Observing and Measuring: taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate | Recording: recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs | Predicting: using test results to make predictions to set up further comparative and fair tests | Reporting and Presenting: 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 Evidence: identifying scientific evidence that has been used to support or refute ideas or arguments. |
| | <ul style="list-style-type: none"> with growing independence, raise their own relevant questions about the world around them in response to a range of scientific experiences; with increasing independence, make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; explore and talk about their ideas, raising different kinds of scientific questions; ask their own questions about scientific phenomena; select and plan the most appropriate type of scientific enquiry to use to answer scientific questions; make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them; | <ul style="list-style-type: none"> choose the most appropriate equipment to make measurements and explain how to use it accurately; take measurements using a range of scientific equipment with increasing accuracy and precision; take repeat readings when appropriate; understand why we take an average in repeat readings. | <ul style="list-style-type: none"> independently group, classify and describe living things and materials; use and develop keys and other information records to identify, classify and describe living things and materials; decide how to record data from a choice of familiar approaches; record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs. | <ul style="list-style-type: none"> plan, set up and carry out comparative and fair tests to answer questions, including recognising and controlling variables where necessary; use their test results to identify when further tests and observations may be needed; use test results to make predictions for further tests. | <ul style="list-style-type: none"> notice patterns; draw conclusions based in their data and observations; use their scientific knowledge and understanding to explain their findings; read, spell and pronounce scientific vocabulary correctly; identify patterns that might be found in the natural environment; look for different causal relationships in their data; discuss the degree of trust they can have in a set of results; independently report and present their conclusions to others in oral and written forms. | <ul style="list-style-type: none"> use primary and secondary sources evidence to justify ideas; identify evidence that refutes or supports their ideas; recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact; use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas; talk about how scientific ideas have developed over time. |

Programme of Study: Content for Year 5

| | Biology | Chemistry | Physics | | |
|---------------------|---|--|--|---|---|
| | Living things and their habitats ACE Question: Do all living things start life as an egg? | Animals, including humans ACE Question: How different will you be when you're as old as the Queen? | Properties and changes in materials ACE Question: How can matter change its state? | Forces ACE Question: Can you feel the force? | Earth and Space ACE Question: Will we ever send another human to the moon? |
| National Curriculum | <ul style="list-style-type: none"> describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird | <ul style="list-style-type: none"> describe the changes as humans develop to old age. | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object | <ul style="list-style-type: none"> 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 |

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| | <ul style="list-style-type: none"> describe the life process of reproduction in some plants and animals. | | <ul style="list-style-type: none"> 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, incl metals, wood, plastic demonstrate that dissolving, mixing and changes of state are reversible changes explain some changes result in the formation of new materials, and that this kind of change is not usually reversible, incl changes associated with burning and the action of acid on bicarb of soda. | <ul style="list-style-type: none"> identify the effects of air resistance, water resistance and friction, that act between moving surfaces recognise that some mechanisms, incl levers, pulleys and gears, allow a smaller force to have a greater effect. | <ul style="list-style-type: none"> 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. |
| Sticky knowledge | <ul style="list-style-type: none"> Know the life cycle of a mammal (rabbit) , an amphibian (frog) & an insect (butterfly)- (metamorphosis) and a bird (chicken) Know the process of sexual and asexual reproduction in plants Know the process of reproduction in animals | <ul style="list-style-type: none"> Know the stages of growth in humans Know the gestation period is different between different animals, including humans Know about the changes experienced in puberty | <ul style="list-style-type: none"> Compare and group materials based on their properties (e.g. hardness, solubility, transparency, conductivity, [electrical & thermal], and response to magnets Know and explain how a material dissolves to form a solution Know and show how to recover a substance from a solution Know and demonstrate how some materials can be separated (e.g. through filtering, sieving and evaporating) Know and demonstrate that some changes are/aren't reversible Know how some changes result in the formation of a new material and that this is usually irreversible | <ul style="list-style-type: none"> Know what gravity is and its impact on our lives Identify and know the effect of air and water resistance Identify and know the effect of friction Know how levers, pulleys and gears allow a smaller force to have a greater effect | <ul style="list-style-type: none"> Know about and explain the movement of the Earth and other planets relative to the Sun Know about and explain the movement of the Moon relative to the Earth Know the Sun, Earth and Moon are approximately spherical bodies Know how night and day are created |
| Vocabulary | <ul style="list-style-type: none"> Mammal, Insect, Amphibian, Bird, Reproduction, Offspring, Life Cycle, Germination, Fertilization, Hatch, Larva, Pupa, Nymph, Embryo, Foetus, Womb, Gestation, Metamorphosis, | <ul style="list-style-type: none"> Embryo, Foetus, Womb, Gestation Baby, Toddler, Teenager, Elderly, Growth, Development, Puberty | <ul style="list-style-type: none"> Hardness, Solubility, Transparency, Electrical Conductivity, Thermal Conductivity, Magnetic, Filter, Evaporation, Dissolving, Mixing, Reversible, Irreversible | <ul style="list-style-type: none"> Gravity, Newton, Force Air resistance, Water resistance, Friction Mechanism, Levers, Gears, Pulleys, Load, Effort | <ul style="list-style-type: none"> Earth, Sun, Moon, Axis, Orbit, Rotation, Day, Night, Phases of the Moon, star, constellation, Solar System, Spherical Bodies, Satellite, Astronomer |
| Useful References / Resources | https://www.twinkl.co.uk/resource/tp2-s-243-planit-science-year-5-living-things-and-their-habitats-unit-pack https://www.bbc.co.uk/bitesize/topics/zgssgk7 | https://www.twinkl.co.uk/resource/tp2-s-042-planit-science-year-5-animals-including-humans-unit-pack https://www.bbc.co.uk/bitesize/topics/zgssgk7/articles/z2msv4j | https://www.twinkl.co.uk/resource/tp2-s-111-planit-science-year-5-properties-and-changes-of-materials-unit-pack https://www.bbc.co.uk/bitesize/topics/z4339j6/articles/zx8hhv4 https://www.bbc.co.uk/bitesize/topics/zcvv4wx | https://www.twinkl.co.uk/resource/science-forces-year-5-unit-pack-tp2-s-330 https://www.bbc.co.uk/bitesize/topics/zf66fg8/articles/zqbm3k7 https://www.bbc.co.uk/bitesize/topics/zsxxsbk https://www.bbc.co.uk/bitesize/topics/zc89k7h/articles/zytqj6f | https://www.twinkl.co.uk/resource/tp2-s-100-planit-science-year-5-earth-and-space-unit-pack https://www.bbc.co.uk/bitesize/topics/zwccwmn/articles/zqbx82 https://www.bbc.co.uk/bitesize/topics/zdrrd2p |

Year 5 Enquiry Types

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| Observing Over Time | How does a bean change as it germinates? | | How does a container of salt water change over time? | How long does a pendulum swing before it stops? | |
| Pattern Seeking | | Are the oldest children in our school the tallest? | Do all materials stretch in the same way? | | Is there a pattern between the size of a planet and the time it takes to travel around the sun? |
| Identifying & Classifying | | Can you identify all the stages in the human life cycle? | | | Can you observe and identify all of the phases in the cycle of the moon? |
| Fair and Comparative Tests | | | Which type of sugar dissolves the fastest? | Which shape parachute takes the longest time to fall? | |
| Researching using Secondary Sources | What are the differences between the life cycle of an insect and a mammal? | Why do people get grey/white hair when they get older? | | | |

Science: Year 6

Programme of Study: Working Scientifically - Years 5 and 6

These opportunities for working scientifically should be provided across years 5 and 6 so that the expectations in the PoS can be met by the end of Y6. Pupils are not expected to cover each aspect for every area of study.

highlighted text indicates new skills to be introduced in Year 6 (unhighlighted indicates previously introduced in Year 5)

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| <p>During Years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content. Pupils are not expected to cover each aspect for every area of study.</p> | <p>Questioning and Testing: planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</p> | <p>Observing and Measuring: taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate</p> | <p>Recording: recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</p> | <p>Predicting: using test results to make predictions to set up further comparative and fair tests</p> | <p>Reporting and Presenting: 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</p> | <p>Identifying Evidence: identifying scientific evidence that has been used to support or refute ideas or arguments.</p> |
| | <ul style="list-style-type: none"> with growing independence, raise their own relevant questions about the world around them in response to a range of scientific experiences; with increasing independence, make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; explore and talk about their ideas, raising different kinds of scientific questions; ask their own questions about scientific phenomena; select and plan the most appropriate type of scientific enquiry to use to answer scientific questions; make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them; | <ul style="list-style-type: none"> choose the most appropriate equipment to make measurements and explain how to use it accurately; take measurements using a range of scientific equipment with increasing accuracy and precision; take repeat readings when appropriate; understand why we take an average in repeat readings. | <ul style="list-style-type: none"> independently group, classify and describe living things and materials; use and develop keys and other information records to identify, classify and describe living things and materials; decide how to record data from a choice of familiar approaches; record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs. | <ul style="list-style-type: none"> plan, set up and carry out comparative and fair tests to answer questions, including recognising and controlling variables where necessary; use their test results to identify when further tests and observations may be needed; use test results to make predictions for further tests. | <ul style="list-style-type: none"> notice patterns; draw conclusions based in their data and observations; use their scientific knowledge and understanding to explain their findings; read, spell and pronounce scientific vocabulary correctly; identify patterns that might be found in the natural environment; look for different causal relationships in their data; discuss the degree of trust they can have in a set of results; independently report and present their conclusions to others in oral and written forms. | <ul style="list-style-type: none"> use primary and secondary sources evidence to justify ideas; identify evidence that refutes or supports their ideas; recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact; use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas; talk about how scientific ideas have developed over time. |

Programme of Study: Content for Year 6

| | Biology | | | Physics | |
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| | Animals, including humans ACE Question: What would a journey through your body look like? | Living things and their habitats ACE Question: How would you be classified? | Evolution and Inheritance ACE Question: Have we always looked like this? | Electricity ACE Question: Do you have the power to light up the dark? | Light ACE Question: Can you see the light? |
| National Curriculum | <ul style="list-style-type: none"> identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood | <ul style="list-style-type: none"> describe how living things are classified into broad groups according to common observable characteristics and based on | <ul style="list-style-type: none"> recognise that living things have changed over time and that fossils provide information about living things | <ul style="list-style-type: none"> associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit | <ul style="list-style-type: none"> recognise that light appears to travel in straight lines use the idea that light travels in straight lines to explain that objects are seen |

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| | <ul style="list-style-type: none"> recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function describe the ways in which nutrients and water are transported within animals, including humans | <p>similarities and differences, including microorganisms, plants and animals</p> <ul style="list-style-type: none"> give reasons for classifying plants and animals based on specific characteristics. | <p>that inhabited the Earth millions of years ago</p> <ul style="list-style-type: none"> recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. | <ul style="list-style-type: none"> compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches use recognised symbols when representing a simple circuit in a diagram. | <p>because they give out or reflect light into the eye</p> <ul style="list-style-type: none"> 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. |
| Sticky knowledge | <ul style="list-style-type: none"> Identify and name the main parts of the human circulatory system Know the function of the heart, blood vessels and blood Know the impact of diet, exercise, drugs and lifestyle on health Know the ways in which nutrients and water are transported in animals, including humans | <ul style="list-style-type: none"> Give reasons for classifying plants and animals in a specific way Know that living things are classified into broad groups according to observable characteristics and based on similarities and differences Know some ways that living things can be classified (<i>Micro-organisms, Plants, Animals; Herbivores, Carnivores, Omnivores; Amphibians, Reptiles, Mammals, Insects, Fish, Birds, Arachnids</i>) | <ul style="list-style-type: none"> Know how the Earth and living things have changed over time Know how fossils can be used to find out about the past Know about reproduction and offspring (recognising that offspring normally vary and are not identical to their parents) Know how some animals and plants are adapted to suit their environment Know what evolution is and link this to adaptation over time. | <ul style="list-style-type: none"> Compare and give reasons for why components work and do not work in a circuit Draw circuit diagrams using correct symbols Know how the number and voltage of cells in a circuit links to the brightness of a lamp or the volume of a buzzer | <ul style="list-style-type: none"> Know how light travels i.e in straight lines Know and demonstrate how we see objects i.e give out or reflect into the eye Know why shadows have the same shape as the object that casts them Know how simple optical instruments work e.g. periscope, telescope, binoculars, mirror, magnifying glass etc. |
| Vocabulary | <ul style="list-style-type: none"> Circulatory, Heart, Blood Vessels, Veins, Arteries, Oxygenated, Deoxygenated, Valve Diet, Carbohydrate, Protein, Fats, Sugar, Vitamins, Dairy Exercise, Respiration, Aerobic, Stamina, Fitness Medicines, Substances, Alcohol, Nicotine, Addiction | <ul style="list-style-type: none"> Characteristics, Classification, Vertebrates, Invertebrates, Micro-organisms, Amphibians, Reptiles, Mammals, Insects, Arachnids | <ul style="list-style-type: none"> Fossils, Adaptation, Evolution, Characteristics, Reproduction, Genetics, Environment | <ul style="list-style-type: none"> Cells, Wires, Bulbs, Switches, Buzzers, Battery, Circuit, Series, Conductors, Insulators, Amps, Volts, Cell, Symbols, Circuit Diagram | <ul style="list-style-type: none"> Refraction, Reflection, Light, Spectrum, Rainbow, Colour, |
| Useful References / Resources | https://www.twinkl.co.uk/resource/tp2-s-090-planit-science-year-6-animals-including-humans-unit-pack https://www.bbc.co.uk/bitesize/topics/zwd6yc | https://www.twinkl.co.uk/resource/tp2-s-260-planit-science-year-6-living-things-and-their-habitats-unit-pack https://www.bbc.co.uk/bitesize/topics/zfxsbk/articles/zsgtrwx https://www.bbc.co.uk/bitesize/topics/zn22pv4 | https://www.twinkl.co.uk/resource/tp2-s-121-new-planit-science-year-6-evolution-and-inheritance-unit-pack https://www.bbc.co.uk/bitesize/topics/zvhhvcw | https://www.twinkl.co.uk/resource/tp2-s-226-planit-science-year-6-electricity-unit-pack https://www.bbc.co.uk/bitesize/topics/zj44jxs | https://www.twinkl.co.uk/resource/tp2-s-051-planit-science-year-6-light-unit-pack https://www.bbc.co.uk/bitesize/topics/zbssgk7 |

Enquiry Types

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| Observing Over Time | | What happens to a piece of bread if you leave it on the windowsill for two weeks? | How have the features of animals changed over time? | | |
| Pattern Seeking | | | Is there a pattern between the size and shape of a bird's beak and the food it will eat? | | Does the temperature of a lightbulb go up the longer it is left on? |
| Identifying & Classifying | Which organs of the body make up the circulation system, and where are they found? | | | How would you group electrical components and appliances based on what electricity makes them do? | Can you identify all of the colours of light that make white light when mixed together? What colours do you get if you mix different colours of light together? |
| Fair and Comparative Tests | Which type of exercise has the greatest effect on our heart rate? (C) | | | How does the voltage of the battery in the circuit affect the brightness of the lamp (F)? | |
| Researching using Secondary Sources | How much exercise should we do in a week? | What do different types of micro-organisms do? Are they always harmful? | What happened when Charles Darwin visited the Galapagos Islands? | | What did Newton discover about the spectrum of light? |