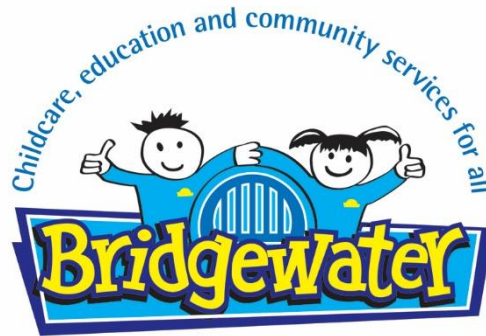


National Curriculum 2014 and Early Years
Framework
Scheme of Work
Science



Statutory Requirements
and school curriculum

Nursery

NC Programme of study

Knowledge

Understanding the World

- Use all their senses in hands-on exploration of natural materials.
- Explore how things work
- Explore collections of materials with similar and/or different properties.
- Talk about what they see, using a wide vocabulary.
- Begin to make sense of their own life-story and family's history
- Plant seeds and care for growing plants.
- Understand the key features of the life cycle of a plant and an animal.
- Begin to understand the need to respect and care for the natural environment and all living things.
- Explore and talk about different forces they can feel.
- Talk about the differences between materials and changes they notice

Communication and Language

- Use a wider range of vocabulary
- Understand 'why' questions, like: "Why do you think the caterpillar got so fat?"
- Be able to express a point of view and to debate when they disagree with an adult or a friend, using words as well as actions.

Working Scientifically

Characteristics of Effective Learning

- Show curiosity about objects, events and people
- Engage in open-ended activity
- Take a risk, engage in new experiences and learn by trial and error
- Find ways to solve problems / find new ways to do things / test their ideas
- Develop ideas of grouping, sequences, cause and effect
- Use senses to explore the world around them
- Make links and notice patterns in their experience

Suggested Activities

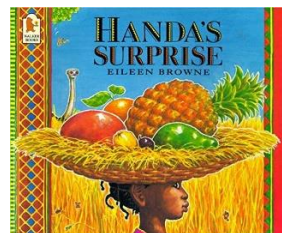
- Learn about life cycles of animals and human
- Explore the surrounding natural environment including natural objects
- Grow plants
- Explore a range of materials
- Change materials by heating and cooling, including cooking
- Feel forces
- Explore how things work
- Explore how objects/materials are affected by forces
- Explore light sources
- Shine light on or through different materials
- Listen to sounds
- Make sounds

Suggested Linked Texted Year N (reading across the curriculum)

One Day on our Blue Planet: In the Savannah
(Ella Bailey)



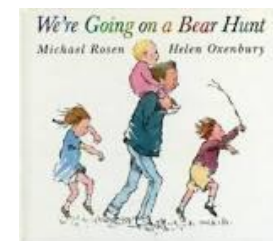
Handa's Surprise



I Really Wonder What Plant I'm Growing
(Lauren Child)



We're Going on a Bear Hunt
(Michael Rosen)



Additional school curriculum including Visits

Science at Foundation Stage is introduced indirectly through activities that encourage children to explore, problem solve, observe, predict, think, make decisions and talk about the world around them. It's called 'knowledge and understanding of the world'. Through Knowledge and Understanding of 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. Children will be encouraged to ask questions about why things happen and how things work and will also be asked questions about what they think will happen to help them communicate, plan, investigate, record and evaluate findings.

Suggested Visits and Visitors include:

- Forest Schools
- Dobbies Garden Centre
- Seasonal walks
- School Nurse
- St James' Church



Reception

NC Programme of study

Knowledge

Understanding the World

- Explore the natural world around them
- Describe what they see, hear and feel whilst outside.
- Recognise some environments that are different to the one in which they live
- Understand the effect of changing seasons on the natural world around them

Early Learning Goal

- Describe their immediate environment using knowledge from observation, discussion, stories, non-fiction texts and maps
- 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.

Communication and Language

- Learn new vocabulary
- Use new vocabulary through the day.
- Ask questions to find out more and to check they understand what has been said to them.
- Articulate their ideas and thoughts in well-formed sentences.

Early Learning Goal

- Listen attentively and respond to what they hear with relevant questions, comments and actions when being read to and during whole class discussions and small group interactions.
- Make comments about what they have heard and ask questions to clarify their understanding
- . Participate in small group, class and one-to-one discussions, offering their own ideas, using recently introduced vocabulary.
- Offer explanations for why things might happen, making use of recently introduced vocabulary from stories, non-fiction, rhymes and poems when appropriate

Working Scientifically

Characteristics of Effective Learning

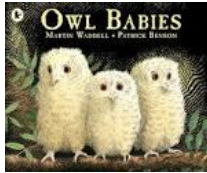
- Show curiosity about objects, events and people
- Engage in open-ended activity
- Take a risk, engage in new experiences and learn by trial and error
- Find ways to solve problems / find new ways to do things / test their ideas
- Develop ideas of grouping, sequences, cause and effect
- Use senses to explore the world around them
- Make links and notice patterns in their experience

Suggested Activities

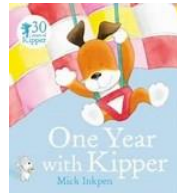
- Compare adult animals to their babies
- Observe how baby animals change over time
- Name and describe animals that live in different habitats. (Minibeasts – spiders, worms, snails)
- Describe different habitats where minibeasts live
- Play and explore in all seasons and in different weather
- Observe living things throughout the year
- Explore a range of materials, including natural materials
- Make objects from different materials, including natural materials
- Observe how materials change when heated and cooled
- Explore Shadows
- Through questioning, explore how to change how things work
- Using kites and streamers, explore how the wind can move objects
- Explore how objects move in water
- Listen to sounds outside and identify the source
- Make and change sounds

Suggested Linked Texted Year R (reading across the curriculum)

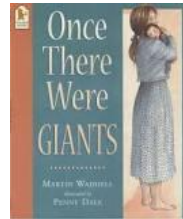
Owl Babies
(Martin Waddell)



One year with Kipper
(Mick Inkpen)



Once there were Giants
(Martin Waddell)



Jasper's Beanstalk
(Nick Butterworth)



Oi Get off our Train
(John Burningham)



Additional school curriculum including Visits

Science at Foundation Stage is introduced indirectly through activities that encourage children to explore, problem solve, observe, predict, think, make decisions and talk about the world around them. It's called 'knowledge and understanding of the world'. Through Knowledge and Understanding of 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. Children will be encouraged to ask questions about why things happen and how things work and will also be asked questions about what they think will happen to help them communicate, plan, investigate, record and evaluate findings.

Suggested Visits and Visitors include:

- Forest Schools
- Dobbies Garden Centre
- Farm
- Seasonal walks
- School Nurse
- Scotswood Garden



Year 1

NC Programme of study

Knowledge

.Plants

- 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.

Animals inc Humans

- 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.

Everyday materials

- distinguish between an object and the material from which it is made
- identify and name a variety of everyday materials, including 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.

Seasonal Changes

- observe changes across the four seasons
- observe and describe weather associated with the seasons and how day length varies.

Working Scientifically

- asking simple questions and recognising that they can be answered in different ways
- observing closely, using simple equipment
- performing simple tests
- identifying and classifying
- using their observations and ideas to suggest answers to questions
- gathering and recording data to help in answering questions.

Key Vocabulary

Plants

Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud

Animals

Head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves
Senses, touch, see, smell, taste, hear, fingers (skin), eyes, nose, ear and tongue

Materials

Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see through, not see through

Seasons

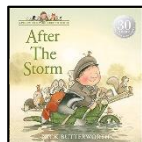
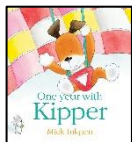
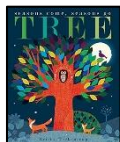
Weather (sunny, rainy, windy, snowy etc.), seasons (Winter, Summer, Spring, Autumn), sun, sunrise, sunset, day length, monsoon, khareef, thunder storm

Suggested Linked Texted Year 1 (reading across the curriculum)

Tree: Seasons Come, Seasons Go
(Patricia Hegarty and Britta Teckentrup)

One Year with Kipper
(Mick Inkpen)

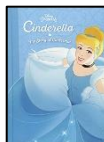
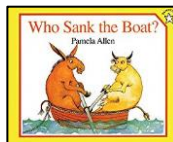
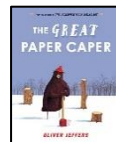
After the Storm
(Nick Butterworth)



The Great Paper Caper
(Oliver Jeffers)

Who Sank the Boat
(Pamela Allen)

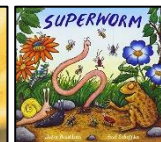
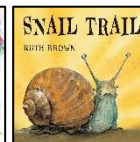
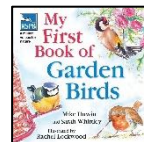
The Story of Cinderella
(Walt Disney)



RSPB: My First Book of Garden Birds
(Mike Unwin and Sarah Whitley)

Snail Trail
(Ruth Brown)

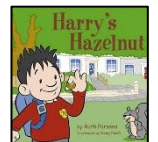
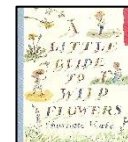
Superworm
(Julia Donaldson & Axel Scheffler)



A Little Guide to Wild Flowers
(Charlotte Voake)

The Things That I LOVE about TREES
(Chris Butterworth)

Harry's Hazelnut
(Ruth Parsons)



Additional school curriculum including Visits

The principal focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.

Suggested Visits and Visitors include:



- Science Club
- Seasonal Walks
- Gardening club
- Forest School
- Author Visit – Viviane French
- Farm



Year 2

NC Programme of study

Knowledge	Working Scientifically
<p>. Plants</p> <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. <p>Living Things and their habitats</p> <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 plants and animals in their habitats, including micro-habitats 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. <p>Animals inc Humans</p> <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, including 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. Use of everyday materials identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. <p>Living Things and their habitats</p> <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 plants and animals in their habitats, including micro-habitats 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"> asking simple questions and recognising that they can be answered in different ways observing closely, using simple equipment performing simple tests identifying and classifying using their observations and ideas to suggest answers to questions gathering and recording data to help in answering questions.
	<p>Key Vocabulary</p> <p>Living things and habitats Living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed, names of local habitats e.g. pond, woodland etc., names of micro-habitats e.g. under logs, in bushes etc.</p> <p>Plants As for year 1 plus - light, shade, sun, warm, cool, water, grow, healthy, germinate</p> <p>Animals and humans Offspring, reproduction, growth, child, young/old stages (examples - chick/hen, baby/child/adult, caterpillar/butterfly), exercise, heartbeat, breathing, hygiene, germs, disease, food types (examples – meat, fish, vegetables, bread, rice, pasta)</p> <p>Materials Names of materials – increased range from year 1 Properties of materials - as for year 1 plus opaque, transparent and translucent, reflective, non-reflective, flexible, rigid, shape, push/pushing, pull/pulling, twist/twisting, squash/squashing. Bend/bending, stretch/stretching</p>
Suggested Linked Texted Year 2 (reading across the curriculum)	

<p>The Tin Forest (Helen Ward)</p> <p>Traction Man (Mini Grey)</p> <p>Three Little Pigs (Lesley Sims)</p> 	<p>Handa's Surprise (Eileen Brown)</p> <p>Once There Were Giants (Martin Waddell and Penny Dale)</p> <p>Tadpole's Promise (Jeanne Willis and Tony Ross)</p> 	<p>Jack and the Beanstalk (Richard Walker)</p> <p>Ten Seeds (Ruth Brown)</p> <p>A Seed Is Sleepy (Dianna Aston)</p> 	<p>The Gruffalo (Julia Donaldson)</p> <p>Meerkat Mail (Emily Gravett)</p> <p>No Place Like Home (Jonathon Emmett)</p> 
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Additional school curriculum including Visits

The principal focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.

Suggested Visits and Visitors include:

- Science Club
- Gardening club



Year 3

NC Programme of study

Knowledge	Working Scientifically
<p>Plants</p> <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 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 <p>Animals, inc Humans</p> <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 muscles for support, protection and movement <p>Rocks and soils</p> <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 recognise that soils are made from rocks and organic matter. <p>Light</p> <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 a solid object find patterns in the way that the size of shadows change. <p>Forces & Magnets</p> <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 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"> asking relevant questions and using different types of scientific enquiries to answer them setting up simple practical enquiries, comparative and fair tests making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers gathering, recording, classifying and presenting data in a variety of ways to help in answering questions recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions identifying differences, similarities or changes related to simple scientific ideas and processes using straightforward scientific evidence to answer questions or to support their findings.
	<p>Key Vocabulary</p> <p>Plants Photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal – wind dispersal, animal dispersal, water dispersal</p> <p>Light Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous</p> <p>Forces and magnets Force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole</p> <p>Rocks and soils Rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, soil, fossil, marble, chalk, granite, sandstone, slate, soil, peat, sandy/chalk/clay soil</p> <p>Animals and humans Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, support, protect, move, skull, ribs, spine, muscles, joints</p>

Suggested Linked Texted Year 3 (reading across the curriculum)

The Owl Who Was Afraid of the Dark
(Jill Tomlinson)

The Dark
(Lemony Snicket)

The Firework-Maker's Daughter
(Philip Pullman)



The Iron Man
(Ted Hughes)

Mrs Armitage: Queen of the Road
(Quentin Blake)

Mr Archimedes' Bath
(Pamela Allen)



The Pebble in My Pocket
(Meredith Hooper)

Stone Girl, Bone Girl
(Laurence Anholt)

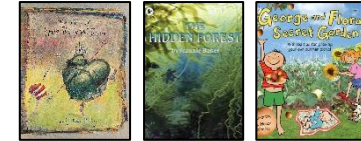
The Street Beneath My Feet
(Charlotte Guillain & Yuval Zommer)



The Story of Frog Belly Rat Bone
(Timothy Basil Ering)

The Hidden Forest
(Jeannie Baker)

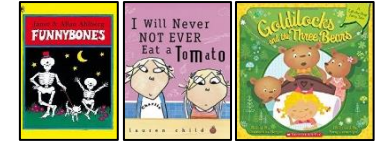
George and Flora's Secret Garden
(Jo Elworthy)



Funnybones
(Janet and Allan Ahlberg)

I Will Never Not Ever Eat a Tomato
(Lauren Child)

Goldilocks and the Three Bears
(Samantha Berger)



Additional school curriculum including Visits

The principal focus of science teaching in lower key stage 2 is to enable pupils to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out..

Suggested Visits and Visitors include:

- Science Club
- Gardening club



Year 4

NC Programme of study

Knowledge	Working Scientifically
<p>Living things and their habitats</p> <ul style="list-style-type: none"> recognise that living things can be grouped in a variety of ways explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment recognise that environments can change and that this can sometimes pose dangers to living things. <p>Animals, inc Humans</p> <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. <p>State of Matter</p> <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 (°C) identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature <p>Sound</p> <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 pitch of a sound and features of the object that produced it find patterns between the volume of a sound and the strength of the vibrations that produced it recognise that sounds get fainter as the distance from the sound source increases. <p>Electricity</p> <ul style="list-style-type: none"> identify common appliances that run on electricity construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit recognise some common conductors and insulators, and associate metals with being good conductors. 	<ul style="list-style-type: none"> asking relevant questions and using different types of scientific enquiries to answer them setting up simple practical enquiries, comparative and fair tests making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers gathering, recording, classifying and presenting data in a variety of ways to help in answering questions recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions identifying differences, similarities or changes related to simple scientific ideas and processes using straightforward scientific evidence to answer questions or to support their findings.
	<p>Key Vocabulary</p> <p>Living things and habitats Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate</p> <p>Animals and humans Digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, teeth, incisor, canine, molar, premolars, herbivore, carnivore, omnivore, producer, predator, prey, food chain</p> <p>Electricity Electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol</p> <p>Sound Sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation</p> <p>States of matter Solid, liquid, gas, state change, melting, freezing, melting point, boiling point, evaporation, temperature, water cycle</p>

Suggested Linked Texted Year 4 (reading across the curriculum)

Horrid Henry Rocks
(Francesca Simon)

Moonbird
(Joyce Dunbar)

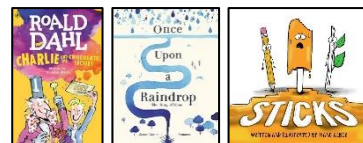
The Pied Piper of Hamelin
(Natalia Vasquez)



Charlie and the Chocolate Factory
(Roald Dahl)

Once Upon a Raindrop: The Story of Water
(James Carter)

Sticks
(Diane Alber)



The Vanishing Rainforest
(Richard Platt)

The Morning I Met a Whale
(Michael Morpurgo)

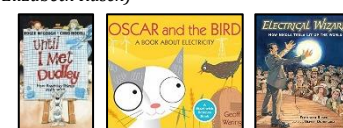
Journey to the River Sea
(Eva Ibbotson)



Until I Met Dudley
(Roger McGough)

Oscar and the Bird: A Book about Electricity
(Geoff Waring)

Electrical Wizard: How Nikola Tesla Lit Up the World
(Elizabeth Rusch)



Human Body Odyssey
(Werner Holzwarth)

Crocodiles Don't Brush Their Teeth
(Colin Fancy)

Wolves
(Emily Gravett)



Additional school curriculum including Visits

The principal focus of science teaching in lower key stage 2 is to enable pupils to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out..

Suggested Visits and Visitors include:

- Science Club
- Gardening club
- Seeds4Life
- Newcastle United Foundation Match Fit Programme
- Hodgekin Park
- Author Visit - Emily Dodd
- Inventors in Residence project



Year 5

NC Programme of study

Knowledge	Working Scientifically
<p>Living things and their habitats</p> <ul style="list-style-type: none"> describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird describe the life process of reproduction in some plants and animals. <p>Animals, inc Humans</p> <ul style="list-style-type: none"> describe the changes as humans develop to old age <p>Properties and changes of materials</p> <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 know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic demonstrate that dissolving, mixing and changes of state are reversible changes explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda. <p>Earth & Space</p> <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 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. <p>Forces</p> <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 identify the effects of air resistance, water resistance and friction, that act between moving surfaces recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. 	<ul style="list-style-type: none"> planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs using test results to make predictions to set up further comparative and fair tests 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 identifying scientific evidence that has been used to support or refute ideas or arguments
	<p>Key Vocabulary</p> <p>Earth and Space Earth, Sun, Moon, (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune) spherical, solar system, rotates, star, orbit, planets</p> <p>Materials Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve reversible/non-reversible change, burning, rusting, new material</p> <p>Forces Force, gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears</p> <p>Animals including humans Vocab to be decided alongside PSHE puberty topic</p> <p>Living things and habitats Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, bulbs, cuttings</p>

Suggested Linked Texted Year 4 (reading across the curriculum)

<p><i>The Enormous Turnip</i> (Katie Daynes)</p> <p><i>Leonardo's Dream</i> (Hans de Beer)</p> <p><i>The Aerodynamics of Biscuits</i> (Clare Helen Welsh)</p> 	<p><i>The Skies Above My Eyes</i> (Charlotte Guillain & Yuval Zommer)</p> <p><i>George's Secret Key to the Universe</i> (Lucy and Stephen Hawking with Christophe Galfard)</p> <p><i>The Way Back Home</i> (Oliver Jeffers)</p> 	<p><i>Goodnight Mister Tom</i> (Michelle Magorian)</p> <p><i>Blackout</i> (John Rocco)</p> <p><i>Hitler's Canary</i> (Sandi Toksvig)</p> 	<p><i>Itch</i> (Simon Mayo)</p> <p><i>Kensuke's Kingdom</i> (Michael Morpurgo)</p> <p><i>The BFG</i> (Roald Dahl)</p> 	<p><i>Charlotte's Web</i> (E.B. White)</p> <p><i>The Land of Neverbelieve</i> (Norman Messenger)</p> <p><i>Mummy Laid an Egg</i> (Babette Cole)</p> 	<p><i>Letters from the Lighthouse</i> (Emma Carroll)</p> <p><i>The Gruffalo's Child</i> (Julia Donaldson)</p> <p><i>The King Who Banned the Dark</i> (Emily Haworth-Booth)</p> 
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Additional school curriculum including Visits

The principal focus of science teaching in upper key stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. At upper key stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.

Suggested Visits and Visitors include:

- Science Club
- Gardening club
- Science Workshop at Newcastle Racecourse courtesy of Centre for Life
- Tim Peake's Space Capsule
- Hoops 4 Health



Year 6

NC Programme of study

Knowledge	Working Scientifically
<p>Living things and their habitats</p> <ul style="list-style-type: none"> describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals give reasons for classifying plants and animals based on specific characteristics. <p>Animals, inc Humans</p> <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 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>Evolution & Inheritance</p> <ul style="list-style-type: none"> recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago 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. <p>Light</p> <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 because they give out or reflect light into the eye explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. <p>Electricity</p> <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 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 	<ul style="list-style-type: none"> planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs using test results to make predictions to set up further comparative and fair tests 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 identifying scientific evidence that has been used to support or refute ideas or arguments
	<h3>Key Vocabulary</h3> <p>Electricity Circuit, complete circuit, circuit diagram, circuit symbol, cell, battery, bulb, buzzer, motor, switch, voltage - NB Children do not need to understand what voltage is but will use volts and voltage to describe different batteries. The words cells and batteries are now used interchangeably</p> <p>Light As for year 3 plus straight lines, light rays.</p> <p>Living things and habitats Vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, insects, spiders, snails, worms, flowering and non-flowering</p> <p>Evolution and Inheritance Offspring, sexual reproduction, vary, characteristics, suited, adapted, environment, inherited, species, fossils</p> <p>Animals including humans Heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, nutrients, water, muscles, cycle, circulatory system, diet, exercise, drugs and lifestyle</p>

Suggested Linked Texted Year 6 (reading across the curriculum)

<p>Beetle Boy (M G Leonard)</p> <p>Insect Soup (Barry Louis Polisar)</p> <p>Fur and Feathers (Janet Halfmann)</p> 	<p>One Smart Fish (Christopher Wormell)</p> <p>The Molliebird (Jules Pottle)</p> <p>Our Family Tree (Lisa Westberg Peters)</p> 	<p>Pig-Heart Boy (Malorie Blackman)</p> <p>Skellig (David Almond)</p> <p>A Heart Pumping Adventure (Heather Manley)</p> 	<p>Hair in Funny Places (Babette Cole)</p> <p>Giant (Kate Scott)</p> <p>You're Only Old Once! (Dr. Seuss)</p> 
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Suggested Visits and Visitors include:

- Science Club
- Gardening club
- Hoops 4 Health
- World Science Centre Day
- Nissan
- Centre for Life
- STEM Day - At the Discovery Museum