

Subject: Science

Progression and Coverage Document

National Curriculum

A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

[National curriculum in England: science programmes of study](#)

Year group	Key investigations	Term and topic	Working scientifically skills covered
Reception	<ul style="list-style-type: none"> Planting Vegetables/Cress and watching them grow. Build a bug hotel. Stick man is frozen. Children try to get him out of the ice. 	Summer term - Shrubs and Bugs Autumn 2 - Into the woods.	N/A
1	<ul style="list-style-type: none"> Three Little Pigs (build a house and test our materials against wind). Plant experiment (light, dark, water no water) Grow white beans in plastic cups to see roots and link to maths (measure water in ml.) 	Spring 2 - Just Julia Summer 2 - Get, Set, Grow!	1,2,3,4,6,7 1,2,3,4,5 6,7
2	<ul style="list-style-type: none"> Superhero material test. What material would be best for a superhero cape? Test materials by bending, twisting and stretching. Making micro habitats and observing which animals/plants are in the micro habitat. Ice cube and Vaseline experiment - to show how animals have adapted to their habitats. 	Autumn 1 - Super me. Autumn 2 - Castles and Dragons/ Summer 1 Amazing Africa Autumn 2 - Castles and Dragons	1,2,3,4,5,6,7 1 2,4,5,6 1,2,3,5,6
3	<ul style="list-style-type: none"> Melting chocolate experiment, different ways to melt chocolate, which one melts quickest? (maths measurement link) Food colouring up flower stems to show water transportation. Volcanic Eruption (Linked to geography learning) 	Spring 2 - Ridiculous Roald Autumn 2 - The Big Freeze & Summer 2 - Excavating Ancient Egypt. Spring 1 - Discovering Dinosaurs	1,2,4,5 6,7,8,9,10,11 (11 link to maths learning) 1,2,4,5,6,7,8,9,10 1,2,5,6,7,9,10
4	<ul style="list-style-type: none"> Conductors vs Insulators Temperature effect on evaporation 	Autumn 2 - Robots Spring 2 - Fabulous Fables & Summer 2 - Mouse, Bird, Snake, Wolf	1,2,4,5,6,7,8,9,10 1,2,3,4,5,6,7,8,9,10,11 (11 link to maths learning)
5	<ul style="list-style-type: none"> Making a Viking ship - which material is best? Water separation 	Autumn 2 - Vikings: Valiant or Vicious? Spring 2 - Mainly Marcus	1,3,4,5,6,7 1,2,3,4,5,6,7
6	<ul style="list-style-type: none"> Measuring a shadow when the light source is moved. Words along Wires. How would you send information in war times? 	Autumn 2 - Shakespeare Spring 1 - Friend or Foe	1,3,4,5,6,7,9 1,2,5,6,7,9

Books to read throughout topics

EYFS	<ul style="list-style-type: none"> • Three Little Pigs (Materials) • Little Red Riding Hood (Habitats) • The Gruffalo by Julia Donaldson (Habitats) • Ten Seeds by Ruth Brown (Plants and Growth)
Year 1	<ul style="list-style-type: none"> • One year with Kipper by Mick Inkpen (Seasons and weather) • The Wild Weather Book by Fiona Danks and Jo Schofield (Non-fiction Weather) • Jack and the Beanstalk (Plants) • RSPB My first book of garden birds (Animals)
Year 2	<ul style="list-style-type: none"> • RSPB My First book of garden birds (Animals) • Once there were giants by Martin Waddell and Penny Dale (Humans and offspring) • Tadpoles Promise by Jeanne Willis and Tony Ross (Animals & Habitats) • The tiny seed by Eric Carle (Plants) • The Dark by Lemony Snickett (Electricity)
Year 3	<ul style="list-style-type: none"> • The pebble in my pocket by Meredith Hooper (Rocks) • Charlie and the Chocolate Factory by Roald Dahl (States of matter) • The firework-makers daughter by Philip Pullman (Light) • The Tantrum that saved the world by Megan Herbert (Humans and their impact on the environment)
Year 4	<ul style="list-style-type: none"> • The Vanishing Rainforest by Richard Platt (Humans and their impact on the environment) • Wolves by Emily Gravett (Food chains) • The little mole who knew it was none of his business by Werner Holzwarth (Digestion) • Lila and the secret of rain by David Conway (Water cycle) • The Dark by Lemony Snickett (Electricity)
Year 5	<ul style="list-style-type: none"> • George's Secret Key to the Universe by Steven and Lucy Hawking (Space) • Charlotte's Web by E.B.White (Lifecycles of different animals)
Year 6	<ul style="list-style-type: none"> • One smart fish by Christopher Wormell (Evolution and Inheritance) • The tin snail by Cameron McAllister (Forces and Engineering)

EYFS National Curriculum

EYFS Development Matters	Enabling Environment	Term and Topic
<p>22 - 36 months</p> <ul style="list-style-type: none"> Enjoys playing with small-world models such as a farm, a garage, or a train track. Notices detailed features of objects in their environment. 	<ul style="list-style-type: none"> Make use of outdoor areas to give opportunities for investigations of the natural world, for example, provide chimes, streamers, windmills and bubbles to investigate the effects of wind. Provide story and information books about places, such as a zoo or the beach, to remind children of visits to real places. 	<p>Continuous provision outside & inside. Autumn 1 - Messy me.</p>
<p>30 - 50 months</p> <ul style="list-style-type: none"> Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world. Can talk about some of the things they have observed such as plants, animals, natural and found objects. Talks about why things happen and how things work. Developing an understanding of growth, decay and changes over time. Shows care and concern for living things and the environment. 	<ul style="list-style-type: none"> Use the local area for exploring both the built and the natural environment. Provide opportunities to observe things closely through a variety of means, including magnifiers and photographs. Provide play maps and small world equipment for children to create their own environments. Teach skills and knowledge in the context of practical activities, e.g. learning about the characteristics of liquids and solids by involving children in melting chocolate or cooking eggs. 	<p>Continuous provision outside & inside. Local area walks for Reception. Cooking every Friday.</p> <p>Summer Term 1 & 2 - Shrubs and bugs.</p>
<p>40 - 60 months</p> <ul style="list-style-type: none"> Looks closely at similarities, differences, patterns and change. 	<ul style="list-style-type: none"> Give opportunities to record findings by, e.g. drawing, writing, making a model or photographing. Provide stories that help children to make sense of different environments. Provide stimuli and resources for children to create simple maps and plans, paintings, drawings and models of observations of known and imaginary landscapes. Give opportunities to design practical, attractive environments, for example, taking care of the flowerbeds or organising equipment outdoors. 	<p>Continuous provision outside & inside. Local area walks for Reception.</p> <p>Summer Term 1 & 2 - Shrubs and bugs.</p>
<p>Early Learning Goal</p> <ul style="list-style-type: none"> 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. 		

Key Stage 1 National Curriculum

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

Working scientifically

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:

- asking simple questions and recognising that they can be answered in different way
- 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

The below tables set out the NC objectives for each Phase and whether we teach them in the first or second year of said Phase.

Year 1

NC objective	Year	Term and topic
<p>Plants</p> <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 	1	Autumn 1 All about Me and Summer 2 Get, Set, Grow!
<p>Animals including humans</p> <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. 	2	Summer 1 Totally Wild
<p>Everyday materials</p> <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, 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 	1	Spring 2 Just Julia and Summer 1 Time Machine
<p>Seasonal Changes</p> <ul style="list-style-type: none"> • observe changes across the 4 seasons • observe and describe weather associated with the seasons and how day length varies. 	1	Autumn 2 Just Julia

Year 2

NC objective	Year	Term and topic
<p><u>Living things and their habitats</u></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 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. 	2 2 2 2	Summer 1 - Amazing Africa Autumn 2- Castles&Dragons Autumn 2 - Castles&Dragons Autumn 2 - Castles&Dragons
<p><u>Plants</u></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 	1 1	Summer 1 - Get, Set Grow! Summer 1 - Get, Set Grow!
<p><u>Animals, including humans</u></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 	2	Summer 1 - Amazing Africa
<p><u>Uses of everyday materials</u></p> <ul style="list-style-type: none"> • 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 	2	Autumn 1 - Super Me!

Lower Key Stage 2 – Years 3 and 4- National Curriculum

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.

Working scientifically

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:

- 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.

The below tables set out the NC objectives for each Phase and whether we teach them in the first or second year of said Phase.

Year 3

NC objective	Year	Term and topic
<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 	3	Summer 1 - Excavating Ancient Egypt
	3	Autumn 2 - The Big freeze
<p>Animals, including 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 	3	Autumn 1 - Who am I? & Spring 2 - Ridiculous Roald
	4	Autumn 1 - Yo me, moi
<p>Rocks</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 	3	Spring 1 - Discovering Dinosaurs

<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 an opaque object find patterns in the way that the size of shadows change 	<p>4</p> <p>4</p>	<p>Spring 2 - Walter Tull</p> <p>Summer 2 - MBSW</p>
<p>Forces and magnets</p> <ul style="list-style-type: none"> compare how things move on different surfaces notice that some forces need contact between 2 objects, but magnetic forces can act at a distance observe how magnets attract or repel each other and attract some materials and not others compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials describe magnets as having 2 poles predict whether 2 magnets will attract or repel each other, depending on which poles are facing. 	<p>3</p>	<p>Summer 2 - Excavating Ancient Egypt</p>

Year 4

NC objective	Year	Term and topic
<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>3</p> <p>3</p> <p>3</p>	<p>Spring 1 - Discovering Dinosaurs</p> <p>Spring 1 - Discovering Dinosaurs</p> <p>Autumn 2 - The Big freeze</p>
<p>Animals, including 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>4</p> <p>3</p> <p>4</p>	<p>Autumn 1 - Yo, mei, moi</p> <p>Autumn 1 - Who am I?</p> <p>Autumn 1 - Yo, mei, moi</p>
<p>States 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>3</p> <p>3</p> <p>4</p>	<p>Spring 2 - Ridiculous Roald</p> <p>Autumn 2 - The Big freeze</p> <p>Spring 2 - Fabulous Fables</p>
<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>4</p>	<p>Spring 1 - Roaming Romans</p>
<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 	<p>2</p> <p>4</p> <p>4</p> <p>4</p> <p>4</p>	<p>Spring 1 - Wet, Wet, Wet Explorers</p> <p>Autumn 2 - Robots</p> <p>Autumn 2 - Robots</p> <p>Autumn 2 - Robots</p> <p>Autumn 2 - Robots</p>

Upper Key Stage 2 – Years 5 and 6- National Curriculum

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.

Working scientifically

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:

- 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

Year 5

NC objective	Year	Term and topic
Living things and their habitats <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 	5	Spring 1 - Radiant Rainforests
	5	Spring 1 - Radiant Rainforests
Animals, including humans <ul style="list-style-type: none"> • describe the changes as humans develop to old age 	6	Autumn 1 - This is me!
Properties and changes of materials <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 	5	Autumn 2 - Vikings
	5	Spring 2 - Mainly Marcus
	5	Spring 2 - Mainly Marcus
	5	Autumn 2 - Vikings
	5	Spring 2 - Mainly Marcus
	5	Spring 2 - Mainly Marcus
Earth and space <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 	5	Summer 2 - Spectacular Space
	5	Summer 2 - Spectacular Space Summer 2 - Spectacular Space

<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 	5 5	Summer 2 - Spectacular Space
<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 	5 5 6	Summer 2 - Spectacular Space Autumn 2 - Vikings: Valiant or Vicious? Summer 1 - A Whale of a Time

Year 6

NC objective	Year	Term and topic
<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 microorganisms, plants and animals give reasons for classifying plants and animals based on specific characteristics 	5	Spring 1 - Radiant Rainforests
<p>Animals including 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 	5	Autumn 1- Same but different
<p>Evolution and 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 	6	Spring 2 - Evolution, where it all began!
<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 	6	Autumn 2 - Shakespeare
<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 	6	Spring 1 - Friend or Foe