

Science Progression Map

Curriculum overview

As part of our Creative Curriculum, we have tried to ensure, as much as possible, that our Science Curriculum links to the key text studied in each year group, whilst still ensuring the key objectives from the National Curriculum are included. The units written in red are additional units for the year group that also provides good links to the text studied.

Year Group	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Reception	Health	Seasons	Materials	Powers/Plants	Animals/Habitats/Potions	Animals
Year 1	Seasonal change	Seasonal Change	Everyday Materials	Animals including Humans	Animals including Humans	Plants
Year 2	Animals Including Humans	Animals Including Humans	Uses of Everyday Materials	Uses of Everyday Materials	Plants	Living things and their habitats
Year 3	Animals Including Humans	Rocks	Forces	Light	Plants	Plants (continue)
Year 4	Animals Including Humans	Electricity	State of Matter	State of Matter	Living things and their habitats	Sound
Year 5	Forces	Properties and Changes of Materials	Properties and Changes of Materials	Space	Animals Including Humans	Living things and their habitats
Year 6	Electricity	Animals including humans	Light	Living things and their habitats	Evolution and inheritance	Secondary School Transitioning

Science at Downsell Primary School

Intent

At Downsell Primary we aim to give all children an understanding of the world around them through the Science curriculum. As one of the core subjects taught at primary level, we give the teaching and learning of science the prominence it deserves.

Learning science is concerned with increasing pupils' knowledge of our world, and with developing skills associated with science as a process of enquiry. Our science curriculum develops the natural curiosity of each child no matter their demographic, encourages them to have respect for living organisms, and to help them to become more inquisitive of the world around us.

We follow the National Curriculum of Study for Science. In line with the National Curriculum, we aim to give children the opportunities in Science to:

- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
- equip them with the scientific knowledge required to understand the uses and implications of science, today and for the future
- Develop an enthusiasm and enjoyment of scientific learning and discovery.

Teacher improvement

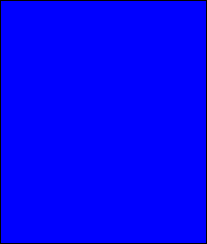
Our teachers are encouraged to continually improve their knowledge and practical competence by:

- Having access to CPD videos that cover every area of the National Curriculum.
- Having a minimum of one science lesson observation per school year with feedback.
- Inspection of pupil work via scrutiny of book work and learning walks.

Children have weekly lessons in Science throughout the school using various programmes of study and resources. In Early years, science is taught through the children learning by play. Additional opportunities are provided in Science, such as weekly science club.

We endeavour to ensure that the Science curriculum we provide will give children the confidence and motivation to continue to further develop their skills into the next stage of their education and life experiences.

Implementation	<p>Each year group has a Science unit to complete every half term. The cover page sets out the curriculum overview, which demonstrates the organisation and coverage of the Science units across the school. Those units featured in a number of year groups gives children the opportunity to develop a deeper understanding of the learning. · Through our planning, we involve problem solving opportunities, allowing children to find out for themselves how to answer questions in a variety of practical means. Children are encouraged to ask their own questions and be given appropriate equipment to use their scientific skills to discover the answers.</p> <p>The emphasis for each unit is on the children learning by ‘doing’. Engaging lessons are created with each lesson having both practical and knowledge elements. Teachers use precise questioning in class to test conceptual knowledge and skills and children are regularly assessed to identify those children with gaps in learning, so that all children keep up. We build upon the learning and skill development of previous years. As the children’s knowledge and understanding increases, and they become more proficient in selecting and using scientific equipment, collating and interpreting results, they become increasingly confident in their growing ability to come to conclusions based on real evidence.</p> <p>In line with the National Curriculum, we use the The Primary Science Advisory Service (PZAZ) scheme of work , alongside our own units linked to the year group text. As children progress through the year groups, they are able to build on their skills in working scientifically, as well as their scientific knowledge, as they develop greater independence in planning and carrying out fair and comparative tests to answer a range of scientific questions.</p>
Impact	<p>Pupil progress can be measured in a number of ways across the curriculum, throughout each unit.</p> <p>We encourage pupils to take an active part in managing and understanding their learning journey. At the start of each unit children are presented with an opportunity to explain what they already know and a question they want to find out the answer to. When they have completed the unit they are encouraged to reflect on their subject entry knowledge and add to this – My Science Learning Journey.</p> <p>The successful approach to the teaching of science at Downsell Primary School will result in a fun, engaging, high quality science education, that provides children with the foundations for understanding the world that they can take with them once they complete their primary education.</p> <p>Formative assessment is used as the main tool for assessing the impact of Science as it allows for misconceptions and gaps to be addressed more immediately rather than building on insecure scientific foundations using formal strategies such as verbal/written outcomes, reflection tasks/presentations).</p> <p>Teachers will also provide summative assessments at the end of each half term through related topic assessment tasks.</p> <p>The subject leader can offer support at any time with identifying opportunities for, and devising suitable assessment approaches or open questions.</p> <p>Children at Downsell Primary School will:</p> <ul style="list-style-type: none"> ● demonstrate a love of science work and an interest in further study and work in this field ● retain knowledge that is pertinent to Science with a real life context. ● be able to question ideas and reflect on knowledge. ● be able to articulate their understanding of scientific concepts and be able to reason scientifically using rich language linked to science

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- work collaboratively and practically to investigate and experiment.
 - majority should achieve age related expectations in Science at the end of their cohort year.

Science Programmes of Study: Key Stage 1 and 2 National curriculum

Key Stage 1 (Years 1 and 2)

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’ is described separately in the programme of study, but must always be taught through and clearly related to the teaching of substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.

Pupils should read and spell scientific vocabulary at a level consistent with their increasing word-reading and spelling knowledge at Key Stage 1.

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 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

Lower Key Stage 2 (Years 3 and 4)

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’ is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.

Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word-reading and spelling knowledge.

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.

Upper Key Stage 2 (Years 5 and 6)

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 and thinking scientifically’ is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.

Pupils should read, spell and pronounce scientific vocabulary correctly.

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

Unit: Animals including Humans



Year Group	Learning Intentions	Scientific skills
1	<ul style="list-style-type: none"> Identify and name a variety of common animals including fish, amphibians, reptiles, birds, and mammals Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds, and mammals, including pets). Identify and name a variety of common animals that are carnivores, herbivores and omnivores. Identify, name, draw and label the basic parts of the human body and say which parts of the body is associated with each sense. 	Pattern Seeking Classifying and Grouping Comparative and Fair testing Research
2	<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. 	Observing over time Pattern Seeking Classifying and Grouping Comparative and fair testing Research
3	<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 animals have skeletons and muscles for support, protection and movement. 	Observing over time Pattern Seeking Classifying and Grouping Comparative and fair testing Research
4	<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. 	Observing over time Pattern Seeking Classifying and Grouping Comparative and fair testing Research

5	<ul style="list-style-type: none"> Describe the changes as humans develop from birth to old age. 	Pattern Seeking Comparative and fair testing Research
6	<ul style="list-style-type: none"> Identify and name the main parts of the human circulatory system, and explain 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 	Observing over time Pattern Seeking Classifying and Grouping Comparative and fair testing Research

Unit: Plants



Year Group	Learning Intentions	Scientific skills
1	<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.	Observing over time Pattern Seeking Classifying and Grouping Comparative and fair testing
2	<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.	Observing over time Pattern Seeking Comparative and fair testing Research
3	<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.	Observing over time Pattern Seeking Comparative and fair testing Research

Unit: Seasonal Changes



Year Group	Learning Intentions	Scientific skills
1	<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	Observing over time Pattern Seeking Comparative and fair testing Research

Unit: Earth and Space



Year Group	Learning Intentions	Scientific skills
5	<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	Pattern Seeking Classifying and Grouping Research

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Unit: Rocks



Year Group	Learning Intentions	Scientific skills
3	<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 	Observing over time Pattern Seeking Classifying and Grouping Comparative and fair testing Research

Unit: Sound



Year Group	Learning Intentions	Scientific skills
4	<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 	Observing over time Pattern Seeking Classifying and Grouping

	<ul style="list-style-type: none"> ● 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 	Comparative and fair testing Research
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Living things and their habitats



Year Group	Learning Intentions	Scientific skills
2	<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 	Observing over time Pattern Seeking Classifying and Grouping Comparative and fair testing Research
4	<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 	Pattern Seeking Classifying and Grouping Comparative and fair testing Research
5	<ul style="list-style-type: none"> ● Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird 	Observing over time Pattern Seeking Classifying and Grouping

	<ul style="list-style-type: none"> Describe the life process of reproduction in some plants and animals 	Comparative and fair testing Research
6	<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 	Observing over time Pattern Seeking Classifying and Grouping Comparative and fair testing Research

Materials



Year Group	Learning Intentions	Scientific skills
1	<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 	Pattern Seeking Classifying and Grouping Comparative and fair testing

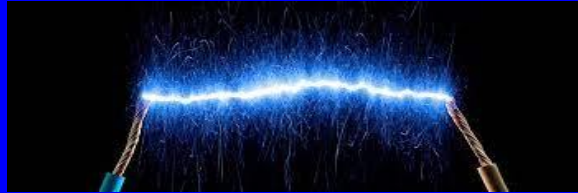
2	<ul style="list-style-type: none"> ● Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses ● Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching 	Pattern Seeking Classifying and Grouping Comparative and fair testing Research
4-	<p><u>States of Matter</u></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 	Observing over time Pattern Seeking Classifying and Grouping Comparative and fair testing Research
5	<p><u>Properties and Changes of Materials</u></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 	Observing over time Pattern Seeking Classifying and Grouping Comparative and fair testing Research

Unit: Forces and Magnets



Year Group	Learning Intentions	Scientific skills
3	<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 	Pattern Seeking Classifying and Grouping Comparative and fair testing Research
5	<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 	Observing over time Pattern Seeking Classifying and Grouping Comparative and fair testing Research

Unit: Electricity



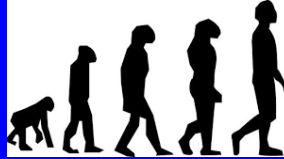
Year Group	Learning Intentions	Scientific skills
4	<ul style="list-style-type: none">● Identify common appliances that run on electricity● Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers● Identify whether or not 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	Pattern Seeking Classifying and Grouping Comparative and fair testing Research
6	<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	Pattern Seeking Comparative and fair testing

Unit: Light



Year Group	Learning Intentions	Scientific skills
3	<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	Pattern Seeking Classifying and Grouping Comparative and fair testing Research
6	<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	Pattern Seeking Classifying and Grouping

Unit: Evolution and Inheritance



Year Group	Learning Intentions	Scientific skills
6	<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	Pattern Seeking Classifying and Grouping Comparative and fair testing Research

Working Scientifically

Alongside these units run the 'working scientifically' element - scientific skills. This focuses on the skills the children need to become accurate, careful and confident practical scientists. Children are expected to master certain skills in each year group and there is a clear progression of skills throughout the curriculum.

Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
asking simple questions and recognising that they can be answered in different ways	asking relevant questions and using different types of scientific enquiries to answer them	planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
observing closely, using simple equipment	setting up simple practical enquiries, comparative and fair tests	taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
performing simple 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	recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
identifying and classifying	gathering, recording, classifying and presenting data in a variety of ways to help in answering questions	using test results to make predictions to set up further comparative and fair tests
using their observations and ideas to suggest answers to questions	recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	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
gathering and recording data to help in answering questions	reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	identifying scientific evidence that has been used to support or refute ideas or arguments
	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	