SCIENCE Curriculum Progression

What will our scientists be able to do when they leave us?

By the end of their time at West Dean C of E Primary school, our Year 6 scientists will have built up a body of knowledge which will enable them to understand how science can be used to explain what is occurring around them, predict how things will behave and analyse causes. They will recognise the power of a rational explanation and be able to articulate scientific concepts clearly and precisely using accurate technical terminology. Scientific learning experiences will have developed an excitement and curiosity about natural phenomena and the world around them. This will prompt the asking of their own questions and the use of the relevant skills needed to work out and explain their answers. They will have an understanding that scientific ideas change and develop over time and how this has and continues to change our lives and futures. This full and rounded understanding of the world around them will impact their lives, influencing the choices that they make so that through their actions they are able to make the world a better place.

Curriculum Coverage (NC)

What are the most basic requirements from the National Curriculum?

Aims

The national curriculum for science aims to ensure that all pupils:

- 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
- are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future

EYFS	Year 1 and 2	Years 3 - 6
In Reception, pupils explore the natural world around them. They describe what they see, hear and feel whilst outside. They understand the effect of changing seasons around them	In KS1, 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.	In 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.

		In 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 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.

Science Curriculum Progression

	EYFS	Year 1	Year 2	Year 3 & Year 4		Year 5 & Year 6	
Plan	• Ask scientific questions • Ask 'why' questions.	• Ask simple questions when prompted • Suggest ways of answering a question	• Ask simple questions • Recognise that questions can be answered in different ways	• Ask relevant questions when prompted • Use different types of scientific enquiry to answer them. • Set up simple and practical enquiries, comparative and fair tests with some support.	• Ask relevant questions. • Use different types of scientific enquiries to answer their questions • Set up simple and practical enquiries, comparative and fair tests	• Plan different types of scientific enquiries to answer questions. • With prompting, recognise and control variables where necessary	• Plan different types of scientific enquiries to answer questions • Recognise and control variables where necessary
Do	• Use new vocabulary • Talk about what they see using a wide vocabulary • Develop their small motor skills so that they can use a range of tools competently, safely and confidently	• Make relevant observations using simple equipment • Conduct simple tests, with support • Identify and classify with guidance	• Observe closely, using simple equipment • Perform simple tests Identify and classify	• Make systematic and careful observations, using simple equipment • Use standard units when taking measurements	• Make systematic and careful observations using a range of equipment, including thermometers and data loggers • Take accurate measurements using standard units, where appropriate	• Select, with prompting, and use appropriate equipment to take readings • Take precise measurements using standard units • Begin to understand the need for repeat readings	• Use a range of scientific equipment to take measurements • Take measurements with increasing accuracy and precision • Take repeat readings when appropriate

	EYFS	Year 1	Year 2	Year 3 & Year 4		Year 5 & Year 6	
Record	• Make comparisons between objects relating to size, length, weight and capacity • Compare quantities using language 'more than, fewer than'	• Gather and record data	• Record and communicate their findings in a range of ways and begin to use simple scientific language Gather and record data to help answer questions	• With modelling and guidance, gather, record, classify and present data in a variety of ways to help to answer questions • With prompting, use various ways of recording, grouping and displaying evidence and suggest how findings may be tabulated	• Gather, record, classify and present data in a variety of ways to help to answer questions Record findings using simple scientific language, drawings and labelled diagrams Record findings using keys, bar charts, and tables	• Take and process repeat readings • Record data and results Record data using labelled diagrams, keys, tables and charts Use line graphs to record data	• Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar charts and line graphs
Review	• Write short sentences with words with known sound letter correspondence. • Begin to describe a sequence of events, real or fictional using words such as first Draw information from a single map	• Recognise findings Use their observations and ideas to suggest answers to simple questions	• Use their observations and ideas to suggest answers to simple questions	• With prompting, suggest conclusions from enquiries Suggest how findings could be reported. Suggest possible improvements or further questions to investigate	• Report on findings from enquiries, including oral and written explanations, of results and conclusions • Report on findings from enquiries using displays or presentations • Identify differences, similarities or changes related to simple scientific ideas and processes • Use straightforward scientific evidence to answer questions or to support their findings • Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions	• Report and present findings from enquiries, including conclusions and, with prompting, suggest causal relationships • With support, present findings from enquiries orally and in writing • Suggest further comparative or fair tests	• Report and present findings from enquiries, including conclusions and causal relationships. • Report and presents findings from enquiries in oral and written forms such as displays and other presentation • Report and present findings from enquiries, including explanations of, and degree of, trust in results • Identify scientific evidence that has been used to support or refute ideas or arguments • Use test results to make predictions to set up further

	EYFS	Year 1	Year 2	Year 3 & Year 4	Year 5 & Year 6
Vocabulary	hard, soft, stretchy, stiff, shiny, dull, rough, smooth, bendy, waterproof, absorbent, wood, plastic, metal, water, fabric, properties, materials. Living, dead, never alive, habitats, food chain, shelter, seashore, woodland. Petal, root, leaf, stalk, water, oxygen, sunshine, soil	aim, answers, block diagrams, changes, compare Describe, difference, different, enquiry, equipment, experience, explore, findings, gather, group, identify (name), investigate, measure, notice, observe , patterns, pictograms, questions, record, same, similarity, simple tables, sort, sorting diagrams, tally charts, test What will we do? (plan) What do you think will happen? (prediction) What happened? (results) What have we found out? (conclusion)		accurate , bar chart, chart, classify comparative test, conclusion (What have we found out?) , criteria, data, develop, diagram, evaluate , evidence, explanation , key, making a test fair , method , observations, plan (What will we do?) , practical enquiry prediction (What do you think will happen?), primary sources , questioning, reasoning, relationships, results (What happened?), secondary sources, standard units, table, What do we change, what do we keep the same, what are we measuring?	accuracy and precision, bar graphs , causal relationship, degree of trust, dependent variable independent variable, justify, line graphs, refute repeat results, scatter graphs, support variables (what do we change, what do we keep the same, how and what are we measuring?)

PLANTS	EYFS	Year 1	Year 2	Year 3 & 4	Year 5 & 6
Vocabulary	plant, sense, life cycle	Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud Names of trees in the local area Names of garden and wild flowering plants in the local area	: Light, shade, sun, warm, cool, water, grow, healthy, germination, seed, survival	Photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersal)	
	• To explore the natural world around them, making observations and drawing pictures of animals and plants. • To understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	• To identify and name a variety of common wild and garden plants, including deciduous and evergreen trees, particularly those within our school grounds. • To identify and describe the basic structure of a variety of common flowering plants, including trees. • To ask questions about how and why different plants grow in our local area.	• To observe and describe how seeds and bulbs grow into mature plants. • To find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. • To describe the best conditions for the growth of plants and their germination. • To set up different tests to see the effect water and light have on growth.	• To identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers and understand that they all have jobs to do. • To 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. • To discover how seeds are formed and how this feeds into a plant's life cycle. • To investigate the way in which water is transported within plants. • To explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. • To be introduced to the idea that plants can make their own food.	

Living Things and Their Habitats	EYFS	Year 1	Year 2	Year 3 & 4	Year 5 & 6
Vocabulary	map, world, environment		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.	Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate	: Puberty – the vocabulary to describe body changes Vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, insects, spiders, snails, worms, flowering, non-flowering
	• To explore the natural world around them, making observations and drawing picture • s of animals and plants. To 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.		• To explore and compare the differences between things that are living, dead, and things that have never been alive though sorting and classifying these things. • To 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. • To compare animals in familiar and unfamiliar habitats. • To identify and name a variety of plants and animals in their habitats, (including microhabitats) focussing upon how living things in our local area depend on each other. • To 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.	• To recognise that living things can be grouped in a variety of ways. • To explore the impact humans have upon habitats with a focus upon Chichester. • To explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. • To make and use simple keys to identify life in the school grounds . • To recognise that environments can change and that this can sometimes pose dangers to living things. • To investigate how the school habitats change over time.	• To describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. • To describe the life process of reproduction in some plants and animals. • To compare the life cycles and reproduction of differing plants / animals. • To 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. • To give reasons for classifying plants and animals based on specific characteristics, particularly unfamiliar animals from a range of habitats. • To find out about the work of Carl Linnaeus, a pioneer in classification.

Forces	EYFS	Year 1	Year 2	Year 3&4	Year 5&6
Vocabulary	push, pull, move, fall			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	Force, push, pull, twist, contact force, non-contact force,gravity, resistance, friction, levers, pulleys, gears, opposing
				• To compare how things move on different surfaces. • To notice that some forces need contact between two objects, but magnetic forces can act at a distance. • To observe how magnets attract or repel each other and attract some materials and not others. • To 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. • To describe magnets as having two poles. • To predict whether two magnets will attract or repel each other, depending on which poles are facing.	• To explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. • To identify the effects of air resistance, water resistance and friction, that act between moving surfaces. • To recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.
Light and Sound	**EYFS**	**Year 1**	**Year 2**	**Year 3&4**	**Year 5&6**
Vocabulary	see, hear, listen, eyes, ears			Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous Sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation	property, light, hardness, solubility, transparency, conductivity (electrical and thermal), magnets Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous Light, plus straight lines, light rays
	• To understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.			• To recognise that they need light in order to see things and that dark is the absence of light. • To notice that light is reflected from surfaces. • To recognise that light from the sun can be dangerous and that there are ways to protect their eyes. • To recognise that shadows are formed when the light from a light source is blocked by an opaque object. • To find patterns in the way that the size of shadows change.	• To recognise that light appears to travel in straight lines. • To 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. • To 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. • To use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.

				Y3 & 4 Light & Sound Continued ● To identify how sounds are made, associating some of them with something vibrating. ● To recognise that vibrations from sounds travel through a medium to the ear. ● To find patterns between the pitch of a sound and features of the object that produced it. ● To find patterns between the volume of a sound and the strength of the vibrations that produced it. ● To recognise that sounds get fainter as the distance from the sound source increases.	
Electricity	**EYFS**	**Year 1**	**Year 2**	**Year 3&4**	**Year 5&6**
Vocabulary				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.	Circuit, complete circuit, circuit diagram, circuit symbol, cell, battery, bulb, buzzer, motor, switch, voltage
				● To identify common appliances that run on electricity. ● To construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. ● To 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. ● To recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. ● To recognise some common conductors and insulators, and associate metals with being good conductors.	● To associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. ● To 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. ● To use recognised symbols when representing a simple circuit in a diagram.

Seasonal changes, Rocks, Earth and Space	EYFS	Year 1	Year 2	Year 3&4	Year 5&6
Vocabulary	Weather (sunny, rainy, windy, snowy etc.) Seasons (winter, summer, spring, autumn)	Weather (sunny, rainy, windy, snowy etc.) Seasons (winter, summer, spring, autumn) Sun, sunrise, sunset, day length	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		: Earth, Sun, Moon, (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune), spherical, solar system, rotates, star, orbit, planets
	• To 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. • To understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	• To observe changes across the four seasons • . To observe and describe weather associated with the seasons and how day length varies	• To compare and group together different kinds of rocks on the basis of their appearance and simple physical properties • . To describe in simple terms how fossils are formed when things that have lived are trapped within rock. • To recognise that soils are made from rocks and organic matter.		• To describe the movement of the Earth, and other planets, relative to the Sun in the solar system. • To describe the movement of the Moon relative to the Earth. • To describe the Sun, Earth and Moon as approximately spherical bodies. • To use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky

Materials	EYFS	Year 1	Year 2	Year 3&4	Year 5&6
Vocabulary	Family, home, community	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	Names of materials – wood, metal, plastic, glass, brick, rock, paper, cardboard 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	Solid, liquid, gas, state change, melting, freezing, melting point, boiling point, evaporation, temperature, water cycle	Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, rusting, new material
	• To 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.	• To distinguish between an object and the material from which it is made. • To identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. • To describe the simple physical properties of a variety of everyday materials • To compare and group together a variety of everyday materials on the basis of their simple physical properties.	• To identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. • To find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	• To compare and group materials together, according to whether they are solids, liquids or gasses. • To 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). • To identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. • To recognise some common conductors and insulators, and associate metals with being good conductors. (Y4 - Electricity).	• To 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. • To know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. • To use knowledge of solids, liquids and gasses to decide how mixtures might be separated, including through filtering, sieving and evaporating. • To give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. • To demonstrate that dissolving, mixing and changes of state are reversible changes. • To 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.