



Science Curriculum

Science	KS1 A	KS1 b	¼ A	¼ B	5/6 A	5/6 B
Who Am I and Who Am I Becoming?	Biology: Animals including Humans	Chemistry: Uses of Everyday Materials	Physics: Light	Biology: Animals Including Humans	Earth Science and Physics: Earth and Space	Physics: Light
Celebrating difference				Physics: Sound	Physics: Forces	Physics: Electricity
Wonders of Christmas						
Heritage and Culture	Biology: Plants	Biology: Living Things and Life Cycles	Chemistry and Earth Science: Rocks and Fossils	Physics: Electricity	Chemistry: Properties and Changes of Materials	Biology: Living Things and Their Habitats
Building a Sustainable and Inclusive World			Physics: Forces and Magnets	Chemistry: Solids, Liquids and Gases		Biology: Evolution and Adaptation
The Easter Story						
Citizenship and the World	Earth Science: Seasonal Changes	Biology: Plants and Animals Including Humans	Biology: Plants and Animals	Biology: Living Things and Their Habitats		
The greatest show	Chemistry: Everyday Materials					

	Reception Year	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
Disciplinary Knowledge - Working Scientifically Skills and Elements of Science Enquiry (examples Below)				
Ask Scientific Questions	<ul style="list-style-type: none"> Begin to ask questions about the world around them 	<ul style="list-style-type: none"> Ask a yes/no questions to aid sorting. Ask one/two simple research questions linked to a topic. Choose a question to undertake a fair test. Ask a question about what might happen over time or that is looking for a pattern. 	<ul style="list-style-type: none"> Ask a range of Yes/No questions to aid sorting Ask a range of research questions linked to a topic. Ask a range of question to undertake a fair test. Ask a range of question about what might happen over time or that is looking for a pattern. 	<ul style="list-style-type: none"> Ask a range of Yes/No questions to aid sorting and decide which ways of sorting will give useful information. Ask a range of questions recognising that some can be answered through research and others may not Ask a range of questions and identify the type of enquiry that will help to answer the questions. Ask further questions based on results.
Plan an Enquiry		<ul style="list-style-type: none"> Identify the headings for the two classification groups (it is ..., it is not ...) Choose equipment to use and decide what to do and what to observe or measure in order to answer the question. 	<ul style="list-style-type: none"> Put appropriate headings onto intersecting Venn and Carroll diagrams. Choose a research source from a range provided Decide what to change and what to measure or observe Decide how often to take a measurement. 	<ul style="list-style-type: none"> Identify specific clear questions that will help to sort without ambiguity Choose suitable sources to use Recognise and independently control variables where necessary. Decide how often to take a measurement.
To observe closely	<ul style="list-style-type: none"> Explore the natural world around them, making observations and drawing pictures of animals and plants. 	<ul style="list-style-type: none"> Compare objects based on obvious, observable features e.g. size, shape, colour, texture etc. Make observations linked to answering the question. 	<ul style="list-style-type: none"> Compare objects based on more sophisticated, observable features and present observations in labelled diagrams. Make a range of relevant observations linked to the question. 	<ul style="list-style-type: none"> Compare not only based on physical properties but also on knowledge gained through previous enquiry. Make a range of relevant observations linked to the question.
To take measurements		<ul style="list-style-type: none"> When appropriate, measure using standard units where all the numbers are marked on the scale. 	<ul style="list-style-type: none"> Measure using standard units (according to age-related mathematics) where not all the numbers are marked on the scale, and take repeat readings where necessary Use dataloggers to measure over time. 	<ul style="list-style-type: none"> Measure using standard units using equipment that has scales involving decimals (according to age-related mathematics), and take repeat readings where necessary. Use dataloggers to measure over time.
To record results	<ul style="list-style-type: none"> Record observations pictorially/photographs. 	<ul style="list-style-type: none"> Record data in simple prepared tables, tally charts, pictorially or by taking photographs. 	<ul style="list-style-type: none"> Prepare own tables to record data. 	<ul style="list-style-type: none"> Prepare own tables to record data, including columns for taking repeat readings
To present results		<ul style="list-style-type: none"> Sort objects and living things into two group using a basic Venn diagram or simple table, Present what they have learnt verbally, using pictures or block diagrams. 	<ul style="list-style-type: none"> Sort objects and living things into groups using intersecting Venn and Carroll diagrams Present what they learnt verbally or using labelled diagrams, bar charts, or time graphs. 	<ul style="list-style-type: none"> Create branching databases (tree diagrams) and keys to enable others to name living things and objects Present what they learnt in a range of ways e.g. different graphic organisers, line graphs and scatter graphs.
To interpret results		<ul style="list-style-type: none"> Talk about the number of objects in each classification group i.e. which has more or less. Answer their questions using simple sentences using their observations or measurements. 	<ul style="list-style-type: none"> Spot patterns in the classification data, particularly two criteria with no examples - e.g. there are no living things with wings and no legs. Answer questions using simple scientific language and refer directly to their evidence when answering their question. 	<ul style="list-style-type: none"> Talk about the features that items share and do not share based on the information in the key etc. Answer questions using scientific evidence gained from a range of sources. Describe causal relationships, change over time and identify patterns.
To draw conclusions			<ul style="list-style-type: none"> Draw simple conclusions, when appropriate, for patterns - e.g. a flying insect with no legs might always crash land. Where appropriate provide oral or written explanations for their findings. 	<ul style="list-style-type: none"> Use data to show that items grouped together have more things in common than with things in other groups Provide detailed oral or written explanations for their findings.
To make a prediction			<ul style="list-style-type: none"> Use results from an investigation to make a prediction about a further result. 	<ul style="list-style-type: none"> Use test results to make predictions for further investigations.
To evaluate an enquiry			<ul style="list-style-type: none"> Suggest improvement (e.g. a wider range of objects) and suggest new questions arising from the investigation. Suggest limitations to research (e.g. only had one book) and suggest new questions arising from the investigation. Suggest improvements (e.g. measurement method) and suggest new questions arising from the investigation. 	<ul style="list-style-type: none"> Explain using evidence that the branching database or classification key will only work for the living things or materials it was created for. Talk about their degree of trust in the sources they used. Explain their degree of trust in their results (e.g. precision in measurements, variables that may not have been controlled, and accuracy of results).

Biology	Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Living Things and Habitats		<p>Taking Care of The Earth (EXTRA) Understand that somenatural resources are limited</p> <p>Learn practical measures for conserving energy and resources</p> <p>Understand that some materials can be recycled</p> <p>Understand that pollution (for example, littering, smog, water pollution) can be harmful</p> <p>Understand how to help reduce pollution</p>	<p>Living Things and Their Habitats (NC)</p> <p>Explore and compare the differences between things that are living, dead, and things that have never been alive</p> <p>Identify that most living things live in habitats to which they are suited and describe how habitats provide for the basic needs of animals and plants, and how they depend on each other</p> <p>Identify and name a variety of plants and animals in their habitats (including micro-habitats) such as forests, meadows & plains, underground, deserts and water</p> <p>Understand oceans and undersea Life</p> <p>Describe how animals obtain their food from plants and other animals using a simple food chain, and identify and name different sources of food</p>	<p>Insects (EXTRA)</p> <p>Understand ways that insects can be helpful, such as: pollination; products like honey, beeswax, and silk; and eating harmful insects</p> <p>Understand ways that insects can harmful such as: destroying crops, trees, wooden buildings, clothes; carrying disease; and biting or stinging</p> <p>Distinguish key characteristics such as: the exoskeleton, the chitin, the six legs and three body parts: head, thorax and abdomen; and wings</p> <p>Understand the life cycles of some insects, including metamorphosis</p> <p>Understand the behaviour of some social Insects</p>	<p>Living Things and Their Habitats (NC)</p> <p>Recognise that living things can be grouped in a variety of ways</p> <p>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</p> <p>Become familiar with and recognise basic characteristics of: fish, amphibians, reptiles, birds and mammals</p> <p>Recognise that environments can change and that this can sometimes pose dangers to living things</p> <p>Understand how ecosystems can be affected by changes in environment (for example, rainfall, food supply, etc.) and by man-made changes</p> <p>Understand man-made effects of the environment</p>	<p>Living Things and Their Habitats (NC)</p> <p>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</p> <p>Describe the life process of reproduction in some plants and animals</p> <p>Understand the growth stages of a human: embryo, foetus, new-born, infancy, childhood, adolescence, adulthood, old age</p> <p>Understand external fertilisation of some animals</p> <p>Understand internal fertilisation of some animals (e.g. birds and mammals)</p> <p>Understand development of an embryo - egg, zygote, embryo, growth in uterus, foetus, new-born</p>	<p>Living Things and Their Habitats (NC)</p> <p>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</p> <p>Give reasons for classifying plants and animals based on specific characteristics</p> <p>Understand basic taxonomy</p> <p>Understand different classes of vertebrates and major characteristics (review of Y4)</p> <p>Understand basic cell structure</p> <p>Understand the differences between animal & plant cells</p>
Plants		<p>Plants (NC)</p> <p>Identify and name a variety of common wild and garden plants, including deciduous/evergreen trees</p> <p>Describe the basic structure of common flowering plants, including trees - seed, root, stem, branch, leaf flower</p>	<p>Plants (NC)</p> <p>Observe and describe how seeds and bulbs grow into mature plants</p> <p>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy</p>	<p>Plants (NC)</p> <p>Identify and describe functions of parts of flowering plants</p> <p>Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, room to grow) and how they vary between plants (<i>revision of year 2 but in depth</i>)</p> <p>Investigate how water is transported within plants</p> <p>Explore the life cycle of flowering plants, including pollination, seed formation and seed dispersal</p>			

Biology	Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Animals		<p>Animals, Including Humans (NC) Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals</p> <p>Identify and name a variety of common animals that are carnivores, herbivores and omnivores</p> <p>Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)</p> <p>Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense</p>	<p>Animals, Including Humans (NC) Find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</p> <p>Notice that animals, including humans, have offspring which grow into adults</p> <p>Understand that offspring are very much (but not exactly) like their parents</p> <p>Understand that most animal babies need to be fed and cared for by their parents, especially human babies</p> <p>Recognise that pets have special needs and must be cared for</p> <p>Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene</p>	<p>Animals, Including Humans (NC) 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</p> <p>Identify that humans and some other animals have skeletons and muscles for support, protection and movement</p> <p>Understand that germs can cause diseases and how to prevent illness, by taking care of your body and having vaccinations</p>	<p>Animals, Including Humans (NC) Describe the simple functions of the basic parts of the digestive system in humans</p> <p>Describe the functions and parts of the excretion system in humans</p> <p>Identify the different types of teeth in humans and functions</p> <p>Understand how to take care of your body with a healthy diet, including the 'food pyramid', vitamins and minerals</p> <p>Construct and interpret a variety of food chains, identifying producers, predators and prey</p> <p>The Human Body: Systems, Vision and Hearing (EXTRA) Understand how the eye works</p> <p>Name parts of the eye: cornea, iris and pupil, lens, retina, optic nerve</p> <p>Understand far-sightedness and near-sightedness</p> <p>Understand how the ear works</p> <p>Name parts of the ear</p>	<p>Animals, Including Humans (NC) <i>(taught as part of Living Things and Their Habitats Year 5 above)</i></p> <p>Describe the changes as humans develop to old age</p>	<p>Animals, Including Humans (NC) Identify and name the main parts of the human circulatory system and describe the functions of the heart, blood vessels and blood</p> <p>Understand the basic workings of the respiratory system</p> <p>Recognise the impact of diet, exercise, drugs and lifestyle on the way bodies function</p> <p>Describe the ways that nutrients/water are transported within humans (revision of year 4)</p> <p>Evolution and Inheritance (NC) Recognise that living things have changed over time and that fossils provide info about living things that inhabited Earth millions of years ago</p> <p>Recognise that living things produce offspring of the same kind but they vary and aren't identical to parents</p> <p>Identify how animals and plants are adapted to suit their environment in different ways and that this leads to evolution</p>

Chemistry	Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Matter		<p>Everyday Materials (NC) Distinguish between an object and the material from which it is made</p> <p>Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.</p> <p>Describe the simple physical properties of a variety of everyday materials</p> <p>Compare and group together a variety of everyday materials on the basis of their simple physical properties</p>	<p>Uses of Everyday Materials (NC) Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.</p> <p>Compare how things move on different surfaces.</p> <p>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching</p>	<p>Roextra (NC) Compare and group together different kinds of roextra on the basis of their appearance and simple physical properties</p> <p>Describe in simple terms how fossils are formed when things that have lived are trapped within rock</p> <p>Recognise that soils are made from roextra and organicmatter</p>	<p>States of Matter (NC) Compare and group materials together according to whether they are solids, liquids or gases</p> <p>Observe that some materials change state when heated or cooled, and measure or research the temperature at which this happens in degrees Celsius</p> <p>Identify the part played by evaporation and condensation in the water cycle: associate the rate of evaporation with temperature</p>	<p>Properties and Changes of Materials (NC) Compare and group together everyday materials on the basis of their properties</p> <p>Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution (solute/solvent)</p> <p>Use knowledge of solids, liquids and gases to decide how mixtures might be separated</p> <p>Give reasons for the particular uses of everyday materials, including metals, wood and plastic</p> <p>Demonstrate that dissolving, mixing and changes of state are reversible changes</p> <p>Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible</p> <p>Geology (EXTRA) Name the Earth's layers: crust, mantle, core (outer core and inner core)</p> <p>Understand movement of tectonic plates (earthquakes, Tsunamis and volcanoes)</p> <p>Understand basic volcanology: active, dormant, extinct volcanoes</p> <p>Understand basic theories of how the continents & oceans were formed, mountain/rock formation</p> <p>Understand the effects of weathering</p>	<p>Chemistry: Matter and Change (EXTRA) Understand the basics of atomic structure: nucleus, protons (positive charge), neutrons (neutral), electrons (negative charge)</p> <p>Understand that atoms are constantly in motion: electrons move around the nucleus in paths called shells (or energy levels)</p> <p>Understand that atoms may join together to form molecules or compounds</p> <p>Name common compounds and their formulas</p> <p>Know that elements have atoms of only one kind</p> <p>Understand the organisation of the periodic table</p> <p>Name some well-known elements and their symbols</p> <p>Understand there are two important categories of elements: metals and non-metals</p> <p>Understand properties of metals: most are shiny, ductile, malleable, conductive</p>

Physics	Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Light				<p>Light (NC) Recognise that we need light in order to see things and that dark is the absence of light</p> <p>To know that light travels at an amazingly high speed and in straight lines</p> <p>Notice that light is reflected from surfaces</p> <p>Recognise that sun rays can be dangerous and that there are ways to protect eyes</p> <p>Identify transparent and opaque objects</p> <p>Recognise that shadows are formed when the light from a light source is blocked by an opaque object</p> <p>Find patterns in the way that the size of shadows change</p>			<p>Light (NC) Recognise that light appears to travel in straight lines (revision)</p> <p>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</p> <p>Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then eyes</p> <p>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</p> <p>Understand workings of different mirrors: plane, concave, convex</p> <p>Understand use of mirrors in telescopes and some microscopes</p>

Physics	Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Sound					<p><u>Sound (NC)</u> Identify how sounds are made, associating some of them with something vibrating</p> <p>Recognise that vibrations from sounds travel through a medium to the ear, and that sound waves are slower than light waves</p> <p>Find patterns between the pitch of sounds and features of the object/speed of vibration</p> <p>Find patterns between the volume of a sound and the strength of the vibrations that produced it</p> <p>Recognise that sounds get fainter as distance from source increases</p>		

Physics	Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Forces		<p>Introduction to Magnetism (EXTRA) Identify familiar everyday uses of magnets (for example, in toys, in cabinet loextra, in refrigerator magnets, etc.)</p> <p>Metals are attracted to magnets and non-metal are not.</p>		<p>Forces and Magnets (NC) Compare how things move on different surfaces</p> <p>Notice that some forces need contact between two objects, but magnetic forces act at a distance</p> <p>Observe how magnets attract or repel each other and attract some materials and not others</p> <p>Group everyday materials on the basis of whether they are attracted to a magnet, and identify magnetic materials (revision)</p> <p>Describe magnets as having two poles</p> <p>Predict whether two magnets will attract or repel each other, depending on which poles are facing</p> <p>Discuss our magnetic field</p> <p>Understand that the Earth behaves like a huge magnet</p> <p>Understand basic use of a magnetised needle in a compass, which always point to the north</p>		<p>Forces (NC) Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object</p> <p>Identify the effects of air resistance, water resistance and friction, that act between moving surfaces</p> <p>Recognise that some mechanisms, including levers, pulleys, gears, inclined planes, wedges and screws allow a smaller force to have a greater effect</p> <p>Understand how a gear works and some of its common uses</p>	

Physics	Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Electricity			<p>Electricity (EXTRA) Name basic parts of simple electric circuits (for example, batteries, wire, bulb or buzzer, switch)</p> <p>Name conductive and nonconductive materials</p> <p>Understand safety rules for electricity</p>		<p>Electricity (NC) Identify common appliances that run on electricity</p> <p>Make simple series circuit - cells, wires, bulbs, switches and buzzers</p> <p>Identify if a lamp will light in a simple circuit, based on being part of a complete loop with a battery</p> <p>Recognise that a switch opens/closes a circuit and associate this with whether or not a lamp lights in a series circuit</p> <p>Recognise conductors & insulators</p>		<p>Electricity (NC) Associate the brightness of a lamp or volume of a buzzer with the number and voltage of cells used in the circuit</p> <p>Compare/give reasons for variations in how components function, including brightness of bulbs, loudness of buzzers and on/off position of switches (open and closed circuits)</p> <p>Understand short circuits</p> <p>Understand electric current</p> <p>Use recognised symbols when representing a simple circuit in a diagram</p>
Space			<p>Astronomy and The Earth (EXTRA) Name the sun and 8 planets Know that the sun is a Henley and is the source of our light and heat (revision of year 1 seasons) Describe basic movement of the planets Understand that the moon moves around the Earth Understand that the Earth rotates</p>			<p>Earth and Space (NC) Describe the movement of the Earth, and other planets, relative to the Sun in the solar system (revision and development of yr2)</p> <p>Describe the movement of the Moon relative to the Earth and understand the moon's phases (revision and development of yr2)</p> <p>Describe the Sun, Earth and Moon as approximately spherical bodies</p> <p>Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky</p> <p>Understand Big Bang theory and the universe</p> <p>Understand how seasons are caused by Earth's orbit and rotation</p>	

Physics	Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Climate and Weather		<p>Seasonal Changes (NC) Observe changes across the four seasons</p> <p>Observe and describe weather associated with the seasons and how day length varies.</p>				<p>Meteorology (EXTRA) Understand the water cycle (Revision and development of year 4)</p> <p>Name different clouds: cirrus, stratus, cumulus</p> <p>Understand the layers of the atmosphere</p> <p>Understand how the Sun and the Earth heat the atmosphere</p> <p>Understand air movement</p> <p>Understand cold and warm fronts</p> <p>Understand forecasting</p> <p>Understand weather maps</p> <p>Understand difference between weather and climate</p>	






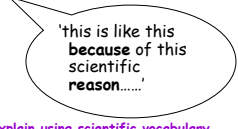
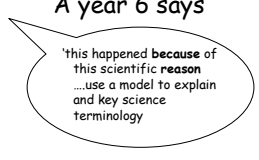
Significant Scientific People of Interest: **Pupils should study at least two influential scientists per year, supported by above exemplar scientists.*


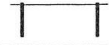
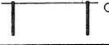




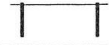
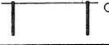




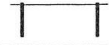
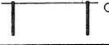




Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Plants Beatrix Potter Author & Botanist	Living Things and Their Habitats Rachel Carson- Marine Pollution Liz Bonnin Conservationist Eugenie Clark- marine biologist	Plants Joseph Banks- Botanist Ahmed Mumin Warfa - Botanist Marianne North- Botanist	Living Things and Their Habitats Jacques Cousteau -Marine Biology Cindy Looy-Environmental Change and Extinction Joean Beauchamp Procter Zoologist <i>Rachel Carson (pollution)</i>	Living Things and Their Habitats Jane Goodall- naturalist Sylvia Earle - Marine biologist Dr. Paula Kahumbu-wildlife conservationist Mangala Mani – Antarctic scientist Sir David Attenborough- Animal Behaviourist	Living Things and Their Habitats Carl Linneus Classification Libby Hyman Classification Invertebrates
Animals inc Humans Chris Packham- Animal Conservationist	Plants Captain Cook- Botanists Agnes Arber Botanist Alan Titchmarsh- Botanist & Gardener	Animals inc Humans Marie Curie- Radiation Wilhelm Rontgen - X rays Adelle Davis - Nutritionist <i>Louis Pasteur (vaccinations)</i> <i>A. Fleming (penicillin)</i>	Animals inc Humans Joseph Lister-Antiseptic Ivan Pavlov- Digestive System Mechanisms Washington & Lucius Sheffield- Toothpaste in a tube	Animals inc Humans Alexander Fleming- Penicillin Louis Pasteur- Vaccination Eva Crane -Reproduction in Bees Virginia Apgar- <u>obstetrical anaesthesiologist</u>	Animals inc Humans Leonardo Da Vinci- anatomy Santorio Santorio-Anatomist Dr. Katherine Dibb – Expert in Cardiovascular Sciences Justus von Liebig- Theories of Nutrition and Metabolism Sir Richard Doll- Linking Smoking and Health Problems

Everyday Materials	Animals inc Humans	Rocks	States of Matter	Properties and changes of Materials	Evolution & Inheritance
<p>William Addis Toothbrush Inventor</p> <p>Charles Mackintosh (Waterproof coat)</p> <p>John MacAdam- roads Chester Greenwood- Earmuffs</p>	<p>Florence Nightingale Pioneer of modern nursing in GB</p> <p>Elizabeth Garrett Anderson - First British female physician and surgeon</p> <p>Steve Irwin -Wildlife expert</p> <p>Robert Winston Human Scientist</p>	<p>Mary Anning- Fossil hunter</p> <p>Dr Anjana Khatwa Geologist</p> <p>Ursula Marvin- Geologist William Smith Fossils strata</p> <p>Inge Lehrmasn -Earth's Mantle</p> <p>Katia Krafft - Geologist and Volcanologist</p>	<p>Joseph Priestly – Discovered oxygen</p> <p>Lord Kelvin -Absolute zero (temperature)</p> <p>Anders Celsius - Temperature Scale</p> <p>Daniel Fahrenheit- Temperature Scale / Invention of the Thermometer</p> <p>George Washington Carver- chemist</p>	<p>Sir Humphrey Davy- Separating gases <i>Benerito (wrinkle free cotton)</i></p> <p>Jamie Garcia (BP website)- Invention of a new plastic</p> <p>Becky Schroeder - fluorecence material</p> <p>Spencer Silver, Arthur Fry and Alan Amron - Post-It Notes</p> <p>Ruth Benerito - Wrinkle-Free Cotton <i>Marie Curie (radiation) Ernest Rutherford (atom)</i></p>	<p>Hippocrates -The Father of Medicine</p> <p>Charles Darwin- Evolution</p> <p>Alfred Russell Wallace – naturalist</p> <p>Rosalind Franklin – DNA</p> <p>Nettie Stevens – Geneticist</p> <p>Professor Alice Roberts - Evolutionary biologist</p>
Seasonal Changes	Uses of Everyday Materials	Light	Sound	Earth and Space	Light
<p>Dr Steve Lyons (Extreme Weather)</p> <p>Holly Green (Meteorologist)</p>	<p>Charles Macintosh- Waterproof material</p> <p>John MacAdam- Tarmac</p>	<p>Justus Von Liebig Mirrors</p> <p>James Clerk Maxwell (Visible and Invisible Waves of Light)</p> <p><i>Thomas Edison (light bulb)</i></p>	<p>Alexander Graham Bell - Invented the telephone</p> <p>Aristotle - Sound Waves Gailileo Galilei - Frequency and Pitch of Sound Waves</p>	<p>Dr Sian Proctor- Analog Astronaut</p> <p>Margaret Hamilton- Computer scientist (Moon Landings)</p> <p>Stephen Hawking- Black Holes</p> <p>Mae Jemison – Astronaut</p> <p>Claudius Ptolemy and Nicolaus Copernicus - Heliocentric vs Geocentric Universe</p> <p>Neil Armstrong- First man on the Moon</p> <p>Helen Sharman- GB astronaut</p> <p><i>Caroline Herschel- First to find a comet</i></p> <p>Valentina Tereshkova-Cosmonaut</p>	<p>Thomas Edison -Invented electric light bulb</p> <p>Patricia Bath (BP website)- saving sight</p> <p>Thomas Young (Wave Theory of Light)</p> <p>Ibn al-Haytham -Light and our Eyes</p> <p>Percy Shaw - The Cats Eye</p> <p>Maria Telkes- Solar energy</p>

				<i>Galileo Galilei (astronomer)</i>	
		<p>Forces & Magnets</p> <p>Andre Marie Ampere- Electro-magnetism</p> <p>The Wright Brothers Airplanes</p> <p>Henry Ford- Cars</p> <p><i>Albert Einstein (physicist)</i></p>	<p>Electricity</p> <p>Michael Faraday- Discovered relationship between magnets and electricity</p> <p>Thomas Edison- Lightbulb</p> <p>Joseph Swan- Incandescent Light Bulb</p>	<p>Forces</p> <p>Isaac Newton- Gravity</p> <p>Albert Einstein- The Theory Of relativity</p> <p>Galileo Galilei - Gravity and Acceleration</p> <p>Archimedes of Syracuse- Levers</p>	<p>Electricity</p> <p>Nikola Telsa -AC electric system - <i>Michael Faraday (inventedelectric motor)</i></p> <p>Alessandro Volta- Electrical Battery</p> <p>Nicola Tesla- Alternating Currents</p> <p>Edith Clarke -Electrical engineer</p>

Scientific Progression Skills Including Data Collection and Presentation of Tables and Graphs

Area	EYFS	Key stage 1	Lower Key stage 2	Upper Key Stage 2
Big Picture progression from Introductions to Key stages	<p>Playing and exploring, children investigate, experience things and have a go.</p> <p>Creating and thinking critically.</p> <p>Children have and develop their own ideas</p> <p>Make links between ideas And develop strategies for doing things</p>	<ul style="list-style-type: none"> Observe Scientific phenomena Be curious and ask questions Develop understanding of science ideas by different types of scientific enquiry Use simple scientific language to talk about what they have found and- Communicate ideas to a range of audiences Learn through practical experience 	<ul style="list-style-type: none"> Broaden their Scientific view Exploring talking about testing and developing their ideas about everyday phenomena Develop ideas about functions, relationships and interactions Ask their own questions Make decisions about type of scientific enquiry Draw Simple conclusions Use some simple scientific language first to talk, later to write, about what they have found out 	<ul style="list-style-type: none"> Develop a deeper understanding of a wide range of scientific ideas Explore and talk about their ideas Ask their own questions about scientific phenomena Analyse functions relationships and interactions systematically Use abstract ideas to understand and predict how the world operates Recognise that Scientific ideas change and develop over time Select the most appropriate way to answer science questions using different types of science enquiry Draw conclusions based on their own data, use evidence to justify their ideas Use scientific understanding to explain their findings
Content	Observe Answer 'how' and 'why' Own experience Talk about ideas	Observe Compare and sort using what see Identify and name Describe	Compare and group according to behaviour/properties, based on testing ; Relate; Cause and effect Comparative and superlative	Sort using evidence using a scientific reason Explain Use abstract ideas Justify their ideas
Talk	Early years says 	<p>A year 1 says</p>  <p>Observe and Identify</p> <p>A year 2 says</p>  <p>Compare and describe</p>	<p>A year 3 says</p>  <p>Compare and group; Cause and effect</p> <p>A year 4 says</p>  <p>Generalisation, Comparative and superlative (Familiar examples)</p>	<p>A year 5 says</p>  <p>Explain using scientific vocabulary Abstract, unfamiliar</p> <p>A year 6 says</p>  <p>Explain and evidence, scientific vocabulary, and Models (Abstract, unfamiliar)</p>
Units	Non standard units	Progression from non standard units? mm; cm; m; ml; l; °C (Don't have to record just use the readings)	Simple accurate measurements (data loggers) Time minutes and secs 1Kg = 1L , °C	Accurate measurements....accuracy and precise N;g; Kg; mm; cm; Mins; secs cm ² V; Km/hr;; M per sec; m/sec; Graphs:- pie; line; bar (year 6)

Area	EYFS	Key stage 1	Lower Key stage 2	Upper Key Stage 2																																													
		 <p>This child has observed and recorded what happens when she dropped the ball from two different heights.</p>	<table border="1" data-bbox="1025 215 1447 502"> <thead> <tr> <th>Where did you drop it</th> <th>How high it bounced</th> </tr> </thead> <tbody> <tr> <td>Top of door</td> <td>5 boxes</td> </tr> <tr> <td>Bookshelf</td> <td>4 boxes</td> </tr> <tr> <td>Bottom of window</td> <td>2 boxes</td> </tr> <tr> <td>Table</td> <td>2 boxes</td> </tr> <tr> <td> </td> <td> </td> </tr> </tbody> </table> <p>This child has completed a table which has been constructed mainly by the teacher. She has carried out three tests and has put the picture record of her results in the correct place.</p> <table border="1" data-bbox="1025 691 1447 930"> <thead> <tr> <th>Height that we dropped it</th> <th>How high it bounced</th> </tr> </thead> <tbody> <tr> <td>1m</td> <td>0.38m</td> </tr> <tr> <td>1.25m</td> <td>0.59m</td> </tr> <tr> <td>1.5m</td> <td>0.68m</td> </tr> <tr> <td>1.75m</td> <td>0.76m</td> </tr> </tbody> </table>	Where did you drop it	How high it bounced	Top of door	5 boxes	Bookshelf	4 boxes	Bottom of window	2 boxes	Table	2 boxes			Height that we dropped it	How high it bounced	1m	0.38m	1.25m	0.59m	1.5m	0.68m	1.75m	0.76m	<table border="1" data-bbox="1657 236 2047 472"> <thead> <tr> <th rowspan="2">Height of drop</th> <th colspan="3">Height of bounce</th> <th rowspan="2">Average</th> </tr> <tr> <th>1st go</th> <th>2nd go</th> <th>3rd go</th> </tr> </thead> <tbody> <tr> <td>1m</td> <td>0.39</td> <td>0.40</td> <td>0.5</td> <td>0.38m</td> </tr> <tr> <td>1.25m</td> <td>0.58</td> <td>0.64</td> <td>0.55</td> <td>0.59m</td> </tr> <tr> <td>1.50m</td> <td>0.68</td> <td>0.79</td> <td>0.80</td> <td>0.76m</td> </tr> </tbody> </table> <p>This child constructed this table on her own choosing the headings, the number of tests, the range of heights she would use and the intervals between them. She also chose to repeat her tests and take an average. She knew the type of table she should use to show all her results.</p>	Height of drop	Height of bounce			Average	1 st go	2 nd go	3 rd go	1m	0.39	0.40	0.5	0.38m	1.25m	0.58	0.64	0.55	0.59m	1.50m	0.68	0.79	0.80	0.76m
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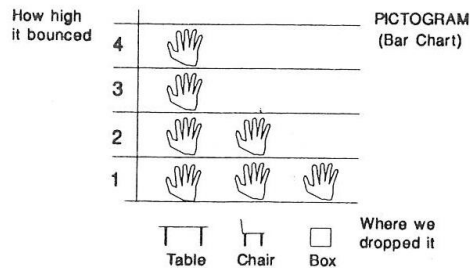
Standing on a chair

Standing on the floor

Big bounce

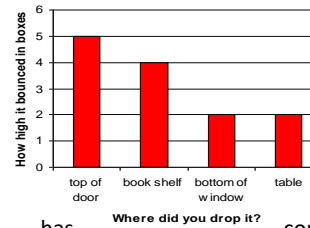
Little bounce

Independent and dependent variable are both described in words so no graph can be drawn



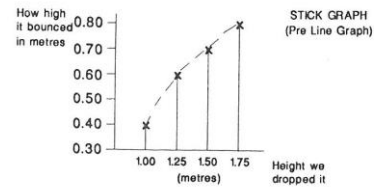
This child **measured the height of the bounce** in hands having marked the spot on the wall. He has **stuck the correct number of hands** one above the other in the correct column on a **chart, which was prepared by the teacher.**

Bar Chart

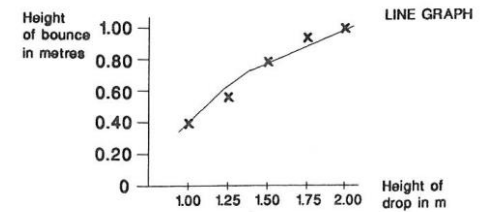


This child has completed a bar chart where the labelling of the axes with the independent and dependent variable had been **prepared by the teacher**, along with the numbers on the vertical axis. The **child filled in the different drop heights** on the horizontal axis and coloured in the correct number of boxes in each column

Stick graph (pre line graph)



In this example the **teacher helped the child to decide on the scale** that should be used on both the vertical and horizontal axes. The **child labelled both axes** with the independent and dependent variables. **The child drew the sticks to the correct length** for each value of the independent variable using the scale on the vertical axes correctly. [N.B. If the child had joined up the crosses on the top of the sticks, it would lead into the line graph.]



This child has **completed the line graph on her own, labelling the axes, deciding on the scales** for both axes and correctly marking the crosses according to the measurements recorded on her table of results. She has **drawn a line of best fit** and she could use this to help her predict the height of bounce for any drop within her range of values.

Science Topic Vocabulary Progression

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Working scientifically	<p>Questions, answers Equipment, gather Measure, record Results, sort Group, test Explore, observe Compare, describe similar/similarities different/differences egg timers, ruler tape measure metre stick beaker, pipette syringe</p>	<p>Questions, answers equipment gather, measure record, results pictogram tally chart block diagram Venn diagram table, chart sort, group, test explore, observe compare, describe similar/similarities different/differences order observe changes over time, link, notice patterns secondary sources hand lenses, egg timers stop watch, ruler tape measure, metre stick beaker, pipette, syringe</p>	<p>questions types of scientific enquiry, answer similarities differences changes, identify classify, sort, group order, link observe changes over time, notice patterns secondary sources comparative tests fair tests, careful accurate observations questions, answers equipment, gather measure, record results, evidence present data/evidence/results keys, bar charts table, results conclusions prediction support/not support thermometers data loggers magnifying glass microscope</p>	<p>questions types of scientific enquiry, answer similarities differences changes, increase decrease, identify classify, sort group, order observe changes over time, notice patterns, link secondary sources comparative tests fair tests, careful accurate observations appearance questions, answers equipment gather, measure record, results evidence, present data/evidence/results keys, bar charts table, results conclusions prediction support/not support thermometers data loggers magnifying glass microscope</p>	<p>questions types of scientific enquiry, answer similarities differences changes, increase decrease, identify classify, sort group, order observe changes over time notice patterns, link secondary sources opinion/fact comparative tests fair tests, variables independent variable dependent variable controlled variable careful, accurate accuracy, precision degree of trust observations questions, answers equipment, gather measure, record results, evidence present data/evidence/results keys classification keys bar charts scatter graphs line graphs, table results conclusions causal relationships prediction support/refute thermometers data loggers magnifying glass microscope</p>	<p>questions types of scientific enquiry, answer similarities differences changes, increase decrease, identify classify, sort, group order observe changes over time, notice patterns link secondary sources opinion/fact comparative tests fair tests, variables independent variable dependent variable controlled variable careful, accurate accuracy, precision degree of trust observations questions, answers equipment, gather measure, record results, evidence present data/evidence/results keys classification keys bar charts scatter graphs line graphs, table results, conclusions causal relationships prediction support/refute thermometers data loggers magnifying glass microscope</p>
Plants	<p>leaf/leaves flower, blossom petal, fruit, berry root, bulb, seed trunk, branch stem, bark</p>	<p>Seeds, bulbs fully grown water, light damp/wet/dry dark/light hot/warm/cool/cold</p>	<p>part, role leaf/leaves flower, blossom, petal, fruit, berry root, bulb, seed trunk, branch, stem</p>			

	stalk, vegetable names of locally found plants and vegetables	use comparatives e.g. hotter grow/growth healthy, shoot seedling wither/limp, die dry/crispy soil, earth	bark, stalk, water light, air, nutrients soil, fertiliser damp/wet/dry dark/light hot/warm/cool/cold use comparatives e.g. hotter grow/growth healthy, transported life cycle, pollination seed formation seed dispersal			
Living things and Habitat		Living, dead, never been alive, move, grow, feed offspring/young/babies name local habitats e.g. a pond e.g. a woodland e.g. a meadow name micro-habitats e.g. under log e.g. on stony path e.g. under bushes damp/wet/dry dark/light hot/warm/cool/cold use comparatives e.g. hotter, suited/suitable basic needs, depend food, food chain		classification keys environment fish, amphibians reptiles, birds mammals vertebrates invertebrates name some invertebrates human impact name positive human impact name negative human impact	life cycle reproduction sexual, asexual germination pollination seed formation seed dispersal pollen, stamen stigma plantlets e.g. spider plant runners e.g. strawberry plant mammal, amphibian insect, bird, fish reptile, eggs live young	organism micro-organisms fungus, mushrooms classification keys environment fish, amphibians reptiles, birds mammals vertebrates invertebrates name some invertebrates arachnid, mollusc insect, crustacean
Animals including humans	Fish, birds amphibians reptiles, mammals carnivores herbivores omnivores pets, body, head neck, arms, elbows legs, knees, face, ears	offspring, babies, young grow, change, adults older/younger baby/toddler/child/teenager basic needs, water, food air, breathing, survival exercise, food types fruit and vegetable	nutrition nutrients food types fruit and vegetable bread, rice, potato, pasta milk and dairy foods foods high in fat or sugar meat, fish, egg, beans carbohydrates	digestive system nutrition, nutrients mouth, teeth canines, incisor molar, pre-molar saliva, tongue rip, tear, chew, grind, cut oesophagus (gullet) stomach		circulatory system heart, blood blood vessels pumps, oxygen carbon dioxide lungs, nutrients water, diet, exercise drugs, lifestyle

	<p>eyes, eyebrows eyelashes, nose, hair mouth, teeth, tongue feet, toes, fingers nails, ankle, calf thigh, hips, waist trunk, chest, back shoulders, hands wrist, tail, wing claw, fin, scales feathers, fur, beak Senses: hear/hearing see/seeing touch/touching smell/smelling taste/tasting rough/smooth bright/dim loud/quiet high/low repeating/continuous (sound)</p>	<p>bread, rice, potato, pasta milk and dairy foods foods high in fat or sugar meat, fish, egg, beans hygiene, clean, wash healthy, medicine, drugs</p>	<p>protein, fat vitamins and mineral dietary fibre, water balanced diet skeleton, muscles support protection movement skull, ribs spine/vertebrae joints, sockets bones, tendons</p>	<p>small intestine large intestine rectum, anus carnivore herbivore omnivore producer consumer predator, prey food chain</p>		
Evolution and Inheritance						<p>evolution suited/suitable environment suited adapted/adaptation offspring characteristics vary/variation inherit/inheritance fossils</p>
Materials	<p>Object, material Wood, plastic, glass Metal, water, rock Brick, paper, fabrics Elastic, foil, wool card/cardboard rubber, clay, hard</p>	<p>suitable/unsuitable use/useful, object, material property, wood, plastic glass, metal, water, rock brick, paper, fabrics elastic, foil</p>		<p>states of matter solid, liquid, gas, air oxygen, powder grain/granular crystals change state ice/water/steam</p>	<p>hard, soft, stretchy rigid, flexible waterproof absorbent strong/weak rough, smooth reflective</p>	

	<p>soft, stretchy, stiff bendy/floppy waterproof absorbent breaks/tears rough, smooth shiny, dull see through not see through</p>	<p>card/cardboard rubber, wool, clay, hard soft, stretchy, rigid, flexible waterproof, absorbent strong/weak , rough smooth, reflective non reflective transparent, opaque translucent, shape changed push/pushing pull/pulling twist/twisting squash/squashing bend/bending stretch/stretching pinch/pinching poke/poking roll/rolling squeeze/squeezing</p>		<p>water vapour heated/heating cooled/cooling temperature degrees Celsius melt, freeze, solidify melting point molten, boil boiling point evaporate/evaporation condense/condensation water cycle precipitation transpiration</p>	<p>non reflective transparent opaque translucent solubility electrical conductivity thermal conductivity melting states of matter solid, liquid, gas change state dissolve, solution soluble, insoluble solute, solvent particle, mix/mixture filtering, sieving evaporating residue, condensing reversible changes new material not usually reversible burning, rusting gas given off</p>	
Seasonal Changes	<p>Season, spring Summer, autumn Winter, weather hot/warm cool/cold sun/sunny cloud/cloudy wind/windy rain/rainy snow/snowing hail/hailing sleet, frost fog/mist, ice/icy rainbow, storm thunder, lightning light/dark</p>					

	day/night					
Rocks			<p>rock, stone, pebble boulder, soil, fossils grains, crystals hard/soft, texture absorb water let water through marble, chalk granite, sandstone slate, sandy soil clay soil, chalky soil peat</p>			
Light			<p>Light, light source names of light sources e.g. torch dark/darkness reflect, reflective mirror, shadow block, direct/ direction transparent opaque translucent</p>			<p>Light, light source names of light sources e.g. torch dark/darkness reflect, reflective mirror, shadow block, absorb direct/ direction transparent opaque , translucent</p>
Sound				<p>Sound, sound source noise travel vibrate/vibration solid/liquid/gas pitch, tune, high/low volume, loud/quiet fainter, muffle strength of vibrations insulation instrument percussion, strings brass, woodwind tuned instrument</p>		

Forces and Magnets			<p>force push/pushing pull/pulling contact force non-contact force magnetic force magnet, strength bar magnet ring magnet button magnet horseshoe magnet attract, repel magnetic material metal, iron, steel non-magnetic material, poles north pole south pole</p>		<p>magnetic force magnet attract</p>	
Forces					<p>Fall, Earth, gravity air resistance water resistance friction moving surfaces mechanisms levers, pulleys gears, force transfers</p>	
Electricity				<p>electricity appliances/device mains, plug electrical circuit complete circuit circuit diagram circuit symbol components cell, battery positive/negative connect/connection loose connection short circuit, wire</p>		<p>electricity appliances/device electrical circuit complete circuit circuit diagram circuit symbol components cell, battery positive/negative terminal connect/connection loose connection short circuit</p>

				crocodile clip bulb, bright/dim switch, buzzer motor, fast(er)/slow(er) conductor insulator metal/non metal		wire, crocodile clip bulb, bright/dim switch, buzzer volume, motor fast(er)/slow(er) conductor, insulator metal/non metal voltage, current resistance
Earth and Space					Earth, planets Sun, solar system Moon, , celestial body sphere/spherical rotate/rotation spin, night and day Mercury, Venus Mars, Jupiter Saturn, Uranus Neptune, Pluto 'dwarf' planet Orbit, revolve geocentric model heliocentric model shadow clocks sundials astronomical clocks	