



Progression in Science

2016 - 2017

Science across the school:

Term	EYFS Nursery	EYFS Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Autumn 1		Say Hello to Me	Seasonal Changes	Plants – school garden	Everyday materials Rocks	Seasonal changes Sound	Everyday Materials - Forces	Everyday materials Electricity – Seasonal Changes - Light
		Awesome autumn	Plants, Animals & humans +garden					
Autumn 2		Terrific technology	Seasonal Changes Everyday materials	Use of Every day Materials	Plants & Living things+ garden	Everyday Materials Electricity	Seasonal Changes - Earth & Space	Plants & Living things Living things & their habitats
Spring 1		Wonderful & Wild Weather	Seasonal Changes Push and pull	Plants – school garden	Light – Day/night report	Plants and living things. Living Things and Habitats – conservation	Everyday materials - Properties and changes of materials	Animals, inc. humans Human physiology, evolution and inheritance
Spring 2		Amazing animals	Seasonal Changes Light & dark	Living thing & their habitats	Everyday Materials Forces & Magnets	Animals, including humans digestion in humans – food chains	The Human Biology (muscles, heart)	Revision
		Let's sow seeds						
Summer 1		Dinosaurs	Seasonal Changes Plants, Animals & humans	Growing, healthy eating, hygiene	Animals including Humans – (teeth)First Aid	Everyday materials - States of matter	Healthy Lifestyle (Teeth revision)	Revision
Summer 2		Terrific transport	Seasonal Changes Plants, Animals & humans	Animals – how they grow and change	Plants & Living things	Digestive system	Puberty	Transition

Working Scientifically: During the course of the year, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<ul style="list-style-type: none"> • Make predictions from observing basic experiments. • Use simple equipment to observe scientific investigations. 	<ul style="list-style-type: none"> • Asking simple questions and recognising that they can be answered in different ways • Observing closely, using simple equipment • Performing simple tests • Identifying and classifying • Using their observations and ideas to suggest answers to questions • Gathering and recording data to help in answering questions. 		<ul style="list-style-type: none"> • Asking relevant questions and using different types of scientific enquiries to answer them • Setting up simple practical enquiries, comparative and fair tests Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions • Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • Identifying differences, similarities or changes related to simple scientific ideas and processes • Using straightforward scientific evidence to answer questions or to support their findings. 		<ul style="list-style-type: none"> • Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • Using test results to make predictions to set up further comparative and fair tests • Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and 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. 	

Plants & Living Things:

Year group	Statutory requirements: Pupils should be taught to...
EYFS	<p>Plants</p> <ul style="list-style-type: none"> • Identify that plants grow from a seed. • Identify parts of a plant - flower, stem, leaf, root • Observe and describe how seeds grow including cress. • Make predictions about how water is absorbed. <p>Living things and their habitats</p> <ul style="list-style-type: none"> • Create habitats for animals in winter using natural resources. • Identify mini beasts in the local environment.
Year 1	<p>Plants</p> <ul style="list-style-type: none"> • Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees • Identify and describe the basic structure of a variety of common flowering plants, including trees.
Year 2	<p>Plants:</p> <ul style="list-style-type: none"> • Observe and describe how seeds and bulbs grow into mature plants (germination, growth, survival) • Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. <p>Living things and their habitats:</p> <ul style="list-style-type: none"> • Explore and compare the differences between things that are living, dead, and things that have never been alive (e.g Is a flame alive? Is a deciduous tree dead in winter?) • Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other • Identify and name a variety of plants and animals in their habitats, including micro-habitats (e.g on the seashore, in woodland, in the ocean, in the rainforest) • Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain (e.g grass, cow, human) and identify and name different sources of food.
Year 3	<p>Plants & living things</p> <ul style="list-style-type: none"> • Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers • Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant • Investigate the way in which water is transported within plants <p>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. (That plants make their own food)</p>

Year 4	<p>Living things and their habitats: Conservation</p> <ul style="list-style-type: none"> • Recognise that living things can be grouped in a variety of ways (e.g put vertebrate animals into groups, fish, amphibians, reptiles, birds and mammals and invertebrates, snails, slugs, worms, spiders and insects) • Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment <p>Recognise that environments can change and that this can sometimes pose dangers to living things.</p>
Year 5	<p>Living things and their habitats:</p> <ul style="list-style-type: none"> • Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird (e.g plants in the vegetable garden or flower border and animals in the local environment) • Research the work of naturalists and animal behaviourists David Attenborough and Jane Goodall. • Describe the life process of reproduction in some plants and animals.
Year 6	<p>Living things and their habitats: Classification</p> <ul style="list-style-type: none"> • Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals <p>Give reasons for classifying plants and animals based on specific characteristics. (e.g classify animals into commonly found invertebrates, insects, spiders, snails, worms and vertebrates, fish, amphibians, reptiles, birds and mammals.)</p>

Animals, including humans:

Year group	Statutory requirements: Pupils should be taught to...
EYFS	All about me <ul style="list-style-type: none"> Identify different coverings of humans and animals – fur, feather, scales and skin Describe the texture of different animals skin Find out about camouflage
Year 1	Animals and Humans <ul style="list-style-type: none"> Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals including those named as pets. Identify and name a variety of common animals that are carnivores, herbivores and omnivores Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets) Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth)
Year 2	Growing, healthy eating, hygiene <ul style="list-style-type: none"> Notice that animals, including humans, have offspring which grow into adults (baby, toddler, child, teenager, adult) 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.
Year 3	Healthy eating, nutrition, teeth, bones and muscles <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 (food groups and how they keep us healthy) Identify that humans and some other animals have skeletons and muscles for support, protection and movement.
Year 4	Digestion in humans, food chains (animal teeth) <ul style="list-style-type: none"> Describe the simple functions of the basic parts of the digestive system in humans (mouth, tongue, teeth, oesophagus, stomach, small and large intestines) Identify the different types of teeth in humans and their simple functions Y3 (teeth of carnivores, herbivores and omnivores) Construct and interpret a variety of food chains, identifying producers, predators and prey.
Year 5	Sexual health and reproduction in humans <ul style="list-style-type: none"> Describe the changes as humans develop to old age. (timeline of changes in the growth and development of humans) Research the gestation period of other animals and compare with humans, e.g the length and mass of a baby as it grows) Discuss puberty and changes to the body. (Talk from NHS)

Year 6	Plant and human physiology <ul style="list-style-type: none">• Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood (explore and answer questions to understand how the circulatory system enables the body to function)• 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. Evolution and inheritance: <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 (e.g consider different breeds of dogs and what happens when e.g Labradors are crossed with poodles)• Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.
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Everyday Materials :

Year group	Statutory requirements: Pupils should be taught to...
EYFS	Everyday Materials <ul style="list-style-type: none"> • Explore and test materials that sink and float. • Identify and name a variety of everyday materials using touch. • Identify the suitability of some materials for their purpose e.g mass
Year 1	Everyday Materials <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 (hard/soft, stretchy/stiff, shiny/dull, rough/smooth, bendy/not bendy, waterproof/not waterproof, absorbent/not absorbent, opaque/transparent.) Push Pull <ul style="list-style-type: none"> • Compare and group together a variety of everyday materials on the basis of their simple physical properties.
Year 2	Uses of everyday materials: <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. • May research people who have developed useful new materials, John Dunlop, Charles Macintosh, John McAdam.
Year 3	Rocks: <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. Forces and magnets: <ul style="list-style-type: none"> • Compare how things move on different surfaces • Notice that some forces need contact between two objects, but magnetic forces can act at a distance • Observe how magnets attract or repel each other and attract some materials and not others (bar, ring, button and horseshoe) • Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials • Describe magnets as having two poles • Predict whether two magnets will attract or repel each other, depending on which poles are facing.

<p>Year 4</p>	<p>States of matter:</p> <ul style="list-style-type: none"> • Compare and group materials together, according to whether they are solids, liquids or gases (solids hold their shape, liquids form a pool, gases escape) • Observe that some materials change state when they are heated or cooled (e.g water as solid, liquid and gas) ,and measure or research the temperature at which this happens in degrees Celsius (°C) • Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. <p>Electricity:</p> <ul style="list-style-type: none"> • Identify common appliances that run on electricity • Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers (draw the circuit using pictorial representation) • Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery • Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit • Recognise some common conductors and insulators, and associate metals with being good conductors.
<p>Year 5</p>	<p>Properties and changes of materials:</p> <ul style="list-style-type: none"> • Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets • Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution • Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating • Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic • Demonstrate that dissolving, mixing and changes of state are reversible changes • Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda. <p>Forces:</p> <ul style="list-style-type: none"> • Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object • Identify the effects of air resistance, water resistance and friction, that act between moving surfaces • Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.
<p>Year 6</p>	<p>Electricity:</p> <ul style="list-style-type: none"> • Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit • Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. • Use recognised symbols when representing a simple circuit in a diagram.

Seasonal Changes:

Year group	Statutory requirements: Pupils should be taught to...
EYFS	<ul style="list-style-type: none"> • Observe changes in Autumn linked to seasonal fruit, Harvest festival, changes in weather patterns. • Recognise hibernation of some animals during the seasons.
Year 1	<ul style="list-style-type: none"> • Observe changes across the four seasons • Observe and describe weather associated with the seasons and how day length varies. (to be warned b=never to look directly at the sun even when wearing dark glasses)
Year 2	<ul style="list-style-type: none"> •
Year 3	Light: <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 (e.g a mirror) • Recognise that light from the sun can be dangerous and that there are ways to protect their eyes • Recognise that shadows are formed when the light from a light source is blocked by a solid object • Find patterns in the way that the size of shadows change (measure shadows and what might cause them to change)
Year 4	Sound: <ul style="list-style-type: none"> • Identify how sounds are made, associating some of them with something vibrating (using musical instruments from around the world) • Recognise that vibrations from sounds travel through a medium to the ear • Find patterns between the pitch of a sound and features of the object that produced it • Find patterns between the volume of a sound and the strength of the vibrations that produced it • Recognise that sounds get fainter as the distance from the sound source increases.
Year 5	Earth and space: <ul style="list-style-type: none"> • Describe the movement of the Earth, and other planets, relative to the Sun in the solar system • Describe the movement of the Moon relative to the Earth • 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.
Year 6	Light: <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.

Data Handling:

Year group	What maths could be included:
EYFS	<p><u>Plants and living things including animals</u> Collect data regarding number of mini beasts/pets using tally chart, pictogram, sorting by a given criteria including number of legs.</p> <p><u>Everyday materials</u> Simple graphs comparing properties of everyday materials</p> <p><u>Seasonal changes</u> Record weather patterns using daily chart</p>
YEAR ONE	<p><u>Plants & Living Things:</u> Frequency of plants Measurement Direction of growth – moss on the North side of trees Position of the sun - describe position, direction and movement, including whole, half, quarter and three-quarter turns.</p> <p><u>Animals:</u> Frequency of animals – pictograms, bar charts and questions regarding them Classification of animals – carnivores, herbivores, omnivores – Venn Diagrams Measurement</p> <p><u>Everyday Materials:</u> Venn diagrams to classify materials – questions about them Simple graphs comparing properties – questions about them</p> <p><u>Seasonal Changes:</u> Time – days, months, seasons – comparisons of living things Record weather patterns – in the summer term ask questions regarding the data held on weather patterns. Seasons linked to the length of day light – record as a block graph, ask questions about your findings</p>
YEAR TWO	<p><u>Plants:</u> Collecting data about plants and bulbs as they grow</p>

	<p>– interpret and construct simple pictograms, tally charts, block diagrams and simple tables ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantityask and answer questions about totalling and comparing categorical data.</p> <p><u>Growing, healthy eating, hygiene</u></p> <p>interpret and present data using bar charts, pictograms and tables of favourite sports or activities; count jumps, squats etc. you can do in one minute and graph the results. Use the data to answer questions. Who did the most? How many jumps did x and y do together?</p> <p><u>Uses of everyday materials</u></p> <p>compare and sort common 2-D and 3-D shapes and everyday objects.</p> <p>identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces</p> <p>interpret and construct simple pictograms, tally charts, block diagrams and simple tables</p> <p>ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity</p> <p>ask and answer questions about totalling and comparing categorical data.</p>
YEAR THREE	<p><u>Plants & Living Things</u></p> <p>Experiment with plants and bulbs growing in different situations (with light, cold, no light etc) record data</p> <p>Use a Venn diagram to categorise reproduction in plants – pollination, seed formation and seed dispersal</p> <p><u>Healthy eating, nutrition, teeth, bones and muscles</u></p> <p>Food groups and proportions for a healthy meal</p> <p>Graph favourite foods – interrogate the data</p> <p>Follow menus for healthy food –</p> <p>Experiment of the use of muscles – large and small; compare durations of events [for example to calculate the time taken by particular events or tasks].</p> <p><u>Rocks</u></p> <p>Classification of rocks – Carroll and Venn diagrams</p> <p><u>Forces and magnets</u></p> <p>compass directions</p> <p>Comparison of objects moving on different surfaces – graph results and then interrogate data</p> <p><u>Light</u></p> <p>recognise angles as a property of shape or a description of a turn</p> <p>identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn;</p> <p>identify whether angles are greater than or less than a right angle plotting shadows finding patterns and explaining why they move.</p>

	<p>Pupils understand and use simple scales (for example, 2, 5, 10 units per cm) in pictograms and bar charts with increasing accuracy. They continue to interpret data presented in many contexts.</p>
YEAR FOUR	<p><u>Living things and their habitats: Conservation</u> classification of living things – Venn diagrams, Carroll diagrams The use of classification keys to group a variety of living things</p> <p><u>States of Matter</u> interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs. solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs create a graph showing the rise in temperature and its effect on evaporation</p> <p><u>Electricity</u> tally electrical equipment in school and create a bar chart of results – interrogate the data Flow diagram (yes/no diagram) of how a simple circuit works</p> <p><u>Sound</u> graph the relationship between pitch and length of object creating it Graph volume against strength of vibrations Graph the distance at which sounds can be heard – interrogate the data – eg. Who can hear the keys dropping furthest away?</p>
YEAR FIVE	<p><u>Living things and their habitats:</u> some classification of creatures into mammal, amphibian, insect and birds using a variety of graphs, created by or for the children in some instances with questions that interrogate the data. Classification of plants that reproduce in the same way, animal reproduction – classifying a variety of animal groups, mammals, marsupials, egg laying birds and reptiles</p> <p><u>Properties and changes of materials:</u> graphs created as a result of gathering information from experiments; graphs to be drawn accurately and correctly. Data then interrogated. Eg. Speed of solids dissolving in water. Using different temperatures of water. Plot results on a graph</p> <p><u>Forces:</u> experiments regarding gravity; air resistance, water resistance and friction can all be recorded in a variety of graphical representations. Then pupils use the graph to answer questions. Relationship graphs regarding gears.</p> <p><u>Seasonal changes</u> scale drawings/representations of the solar system; plotting the phases of the moon on a graph against time and interrogating the data</p>

	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • solve comparison, sum and difference problems using information presented in a line graph • complete, read and interpret information in tables,
<p>YEAR SIX</p>	<p><u>Living things and their habitats: classification</u> Grouping living things according to their features – amphibians, reptiles, birds, fish, mammals etc. and Pupils recognise proportionality in contexts when the relations between quantities are in the same ratio Pupils are to give reasons for classifying the groups as they have. Pupils link percentages or 360° to calculating angles of pie charts.</p> <p><u>Animals including humans</u> Graph heart rate during resting and during various activities and interrogate the resulting data Graph reaction times as more alcohol is ingested!!</p> <p><u>Evolution</u> Scales of graphs that demonstrate the evolution of man!</p> <p><u>Electricity</u> Graphs to show brightness of a lamp or volume of a buzzer when more cells are used in a circuit. Allow the children to graph results following an experiment but also give them graphs with similar data for them to interrogate.</p>