Science

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At Stretham Community Primary School, we recognise the importance of Science in everyday life. We want our pupils to develop a healthy curiosity and respect for the world around them. We want them to love Science and engage with the scientific opportunities they are presented with throughout their years at the school and beyond. It is our intent to provide the pupils with a wide variety of opportunities to explore, ask questions and develop their knowledge, whilst acquiring specific skills to enable them to think and work scientifically. We want to inspire our pupils to become the Scientists of the future. Opportunities for hands-on practical activities are provided as often as possible, through stimulating and challenging lessons, covering knowledge and concepts as specified in the National Curriculum. Key subject-specific vocabulary is built-on and developed throughout the pupils' time in school. We endeavour to engage and enthuse the children through extra-curricular Science opportunities whenever possible, such as celebrating the annual British Science Week, participating in Science Challenges at our partner secondary school and visiting our local nature reserve. At Stretham Community Primary School, we strive to inspire all pupils to fulfil their potential, regardless of background, gender, ethnic origin or additional needs, cultivating a love of Science whilst developing their knowledge, understanding and skills as a scientist.

Foundation Stage

Science at Foundation Stage is taught through the 'Understanding the World' strand of the EYFS Curriculum. It is introduced indirectly through activities that encourage every child to explore, problem solve, observe, predict, think, make decisions and talk about the world around them.

Pupils are given opportunities to explore animals, people, plants, objects and naturally occurring phenomena in the world around them and are encouraged to ask questions about why and how things happen and how things work. Whilst some aspects of Science are taught discreetly, other learning occurs through continuous provision and spontaneous child-led activities, enabling pupils to meet 'The Natural World' Early Learning Goals:

- Explore the natural world around them, making observations and drawing pictures of animals and plants
- 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
- Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

Learning Opportunities	Vocabulary
• Forest school (insect hunts, habitats, flora and fauna, cooking, exploring materials - den building, mud kitchen, fire) • Water tray (floating, sinking, absorbency of materials) • Playdough, paints, sand (properties of materials, colour) • Role play and small world (animals, pets, people, hygiene, our bodies, families, environment) • Construction area and junk modelling (properties of materials) • Growing plants and naming simple parts of a plant • Music (sound and musical instruments) • Cooking (nutrition, healthy living) • Life cycle of a butterfly • Life cycle of a frog • Parts of our body and looking after ourselves	animal, plant, person, body, see, feel, touch, hear, taste, smell, head, neck, arm, elbow, leg, knee, foot, hand, teeth, hair, face, ear, nose, eye, mouth, finger, toe, bones, skeleton, day, night, sun, moon, tree, leaf, flower, petal, stem, caterpillar, butterfly, egg, frogspawn, tadpole, froglet, frog, sound, loud, quiet, colour, water, sand, mud, wet, dry, look, feel, listen, what, why, where.

Key Stage 1		
During years 1 and 2, pupils are encouraged to explore the world around them and ask their own questions. They experience and observe everyday phenomena and are supported to develop their understanding of scientific ideas by using different types of scientific enquiry to answer questions, as well as appropriate secondary sources, such as books, photographs and videos. 'Working Scientifically' is not taught as a separate strand, but instead is embedded within all of the topics. Opportunities for practical activities are provided as often as possible and are designed to cover a range of different types of scientific enquiry. The skills listed below are taught across years 1 and 2 so that expectations can be met by the end of year 2.		
	Skills	**Vocabulary**
Working Scientifically	• 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.	question, answer, observe, test, record, identify, sort.

Year 1		
	Content	**Vocabulary**
Animals Including Humans	• identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals • identify and name a variety of common animals that are carnivores, herbivores and omnivores • describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) • identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense	fish, amphibian, reptile, bird, mammal, carnivore, herbivore, omnivore.
Plants	• 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.	deciduous, evergreen, leaves, root, blossom, seed, fruit, trunk, branch.

Everyday Materials	• distinguish between an object and the material from which it is made • identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock • describe the simple physical properties of a variety of everyday materials • compare and group together a variety of everyday materials on the basis of their simple physical properties.	wood, plastic, glass, metal, rock, hard, soft, smooth, rough, stretchy, stiff, bendy, shiny, dull.
Seasonal Changes	• observe changes across the four seasons • observe and describe weather associated with the seasons and how day length varies.	season, summer, spring, autumn, winter, light, dark, temperature, wind, snow, ice, rain, cloud, Earth.

Year 2		
	Content	**Vocabulary**
Animals Including Humans	• notice that animals, including humans, have offspring which grow into adults • find out about and describe the basic needs of animals, including humans, for survival (water, food and air) • describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	baby, toddler, child, teenager, adult, offspring, life cycle, chrysalis, survival, air, food, water, exercise, fruit, vegetable, fat, sugar, hygiene.
Plants	• observe and describe how seeds and bulbs grow into mature plants • find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	bulb, seedling, mature plant, growth, light, water, soil, temperature.
Living Things and their Habitats	• explore and compare the differences between things that are living, dead, and things that have never been alive • identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other • identify and name a variety of plants and animals in their habitats, including microhabitats • describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.	living, dead, alive, habitat, food chain, energy, woodland, pond, desert, rainforest, ocean.
Use of Everyday Materials	• 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.	brick, paper, cardboard, fabric, foil, solid, squash, twist, stretch, absorbent, waterproof, transparent, elastic.

Lower Key Stage 2

In years 3 and 4, pupils broaden their scientific view of the world around them, exploring ideas about everyday phenomena and developing their ideas about functions and relationships between living things and environments. Pupils are exposed to a range of scientific experiences to enable them to raise their own questions and they start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer a question, how to carry out the enquiry and how to record and analyse their findings. Pupils also find things out using secondary sources of information.

'Working Scientifically' is not taught as a separate strand, but instead is embedded within all of the topics. Opportunities for practical activities are provided as often as possible and are designed to cover a range of different types of scientific enquiry. The skills listed below are taught across years 3 and 4 so that expectations can be met by the end of year 4.

	Skills	Vocabulary
Working Scientifically	• 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.	compare, group, classify, measure, results, fair test, enquiry, predict, table, diagram, chart, pattern, conclusion, plan, present.

Year 3		
	Content	**Vocabulary**
Animals Including Humans	• identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat • identify that humans and some other animals have skeletons and muscles for support, protection and movement.	nutrition, carbohydrate, protein, vitamin, fibre, dairy diet, skull, muscle, movement, support, protection.
Plants	• identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers • explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant • investigate the way in which water is transported within plants • explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	air, nutrients, anchor, germination, reproduction, transportation, dispersal, pollination.
Rocks	• 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.	sediment, natural, fossil, organic, soil, compost, crystal, grainy, crumbly, permeable, durable, erosion.
Light	• recognise that they need light in order to see things and that dark is the absence of light • notice that light is reflected from surfaces • recognise that light from the sun can be dangerous and that there are ways to protect their eyes • recognise that shadows are formed when the light from a light source is blocked by an opaque object • find patterns in the way that the size of shadows change.	light source, shadow, transparent, opaque, translucent, reflect, mirror, block, protect, damage.
Forces and Magnets	• 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 • 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.	force, push, pull, contact, surface, magnetic, poles, attract, repel.

Year 4		
	Content	**Vocabulary**
Animals Including Humans	• describe the simple functions of the basic parts of the digestive system in humans • identify the different types of teeth in humans and their simple functions • construct and interpret a variety of food chains, identifying producers, predators and prey.	tongue, oesophagus, stomach, small and large intestine, rectum, anus, gland, saliva, incisor, canine, molar, decay, producer, predator, prey.
Living Things and their Habitats	• recognise that living things can be grouped in a variety of ways • explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment • recognise that environments can change and that this can sometimes pose dangers to living things.	vertebrate, invertebrate, fish, amphibian, reptile, bird, mammal, characteristic, classify, environment, nature reserve.
States of Matter	• compare and group materials together, according to whether they are solids, liquids or gases • observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C) • identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	solid, liquid, gas, properties, particle, degrees Celsius, thermometer, oxygen, melt, freeze, heat, cool, boil, steam, evaporation, condensation, water cycle.
Sound	• identify how sounds are made, associating some of them with something vibrating • recognise that vibrations from sounds travel through a medium to the ear • find patterns between the pitch of a sound and features of the object that produced it • find patterns between the volume of a sound and the strength of the vibrations that produced it • recognise that sounds get fainter as the distance from the sound source increases.	vibrate, pitch, volume, wave.
Electricity	• identify common appliances that run on electricity • construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers • identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery • recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit • recognise some common conductors and insulators, and associate metals with being good conductors.	cell, bulb, wire, switch, buzzer, battery, motor, complete, circuit, conductor, insulator.

Upper Key Stage 2

In years 5 and 6, pupils develop a deeper understanding of a wide range of scientific ideas, by asking different types of questions about scientific phenomena and analysing functions and relationships more systematically. Pupils select and plan the most appropriate type of scientific enquiry to answer a question, how to gather, record and analyse their data and identify when further tests may be needed. They decide which secondary sources will be most useful to research their ideas and begin to separate opinion from fact. At upper key stage 2, pupils encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They also begin to recognise that scientific ideas change and develop over time.

'Working Scientifically' is not taught as a separate strand, but instead is embedded within all of the topics. Opportunities for practical activities are provided as often as possible and are designed to cover a range of different types of scientific enquiry. The skills listed below are taught across years 5 and 6 so that expectations can be met by the end of year 6.

	Skills	Vocabulary
Working Scientifically	• 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.	Quantitative, variables, accuracy, precision, graph, explanation, evidence, research.

Year 5		
	Content	**Vocabulary**
Animals Including Humans	• describe the changes as humans develop to old age.	gestation, foetus, postnatal, development, puberty, hormone, adolescent, elderly.
Living Things and their Habitats	• describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird • describe the life process of reproduction in some plants and animals.	reproduction, sexual, asexual, pollen, fertilisation, egg, embryo, yolk, albumen, larva, pupa, metamorphosis.
Properties and Changes of Materials	• 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.	dissolve, solution, solubility, electrical and thermal conductivity, transparency, sieve, filter reversible, irreversible.
Earth and Space	• 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.	planet, star, Earth, Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto, dwarf planet, solar system, orbit, constellation.
Forces	• 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.	air resistance, water resistance, friction, gravity, newton, lever, pulley, gear.

Year 6		
	Content	**Vocabulary**
Animals Including Humans	• identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood • recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function • describe the ways in which nutrients and water are transported within animals, including humans.	circulatory system, heart, blood, blood vessels, arteries, veins, lungs, oxygenated, deoxygenated, valve, heart rate, respiration, drugs.
Living Things and their Habitats	• describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals • give reasons for classifying plants and animals based on specific characteristics.	classification, classification key, species, micro-organism, cell, fungus, mould, bacteria, virus.
Evolution and Inheritance	• recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago • recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents • identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.	inheritance, evolution, adaptation, genetics, family, breed, variation, ancestor, trait.
Light	• 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.	spectrum, ray, rainbow, filter, periscope.
Electricity	• 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.	current, voltage, series circuit.

Progression of Key Vocabulary

Foundation	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Animals Including Humans animal, plant, person, body, see, touch, hear, taste, smell, head, neck, arm, elbow, leg, knee, foot, hand, teeth, hair, face, ear, nose, eye, mouth, finger, toe, bones, skeleton.	**Animals Including Humans** fish, amphibian, reptile, bird, mammal, carnivore, herbivore, omnivore.	**Animals Including Humans** baby, toddler, child, teenager, adult, offspring, life cycle, chrysalis, survival, air, food, water, exercise, fruit, vegetable, fat, sugar, hygiene.	**Animals Including Humans** nutrition, carbohydrate, protein, vitamin, fibre, dairy diet, skull, muscle, movement, support, protection.	**Animals Including Humans** tongue, oesophagus, stomach, small and large intestine, rectum, anus, gland, saliva, incisor, canine, molar, decay, producer, predator, prey.	**Animals Including Humans** gestation, foetus, postnatal, development, puberty, hormone, adolescent, elderly.	**Animals Including Humans** circulatory system, heart, blood, blood vessels, arteries, veins, lungs, oxygenated, deoxygenated, valve, heart rate, respiration, drugs.
Plants tree, leaf, flower, petal, stem,	**Plants** deciduous, evergreen, tree, plant, leaves, root, blossom, seed, fruit, trunk, branch.	**Plants** bulb, seedling, mature plant, growth, light, water, soil, temperature.	**Plants** air, nutrients, anchor, germination, reproduction, transportation, dispersal, pollination.			**Evolution and inheritance** inheritance, evolution, adaptation, genetics, family, breed, variation, ancestor, trait.
Living things and their habitats caterpillar, butterfly, egg, frogspawn, tadpole, froglet, frog,		**Living things and their habitats** living, dead, alive, habitat, food chain, energy, woodland, pond, desert, rainforest, ocean.		**Living things and their habitats** vertebrate, invertebrate, fish, amphibian, reptile, bird, mammal, characteristic, classify, environment, nature reserve.	**Living things and their habitats** reproduction, sexual, asexual, pollen, fertilisation, egg, embryo, yolk, albumen, larva, pupa, metamorphosis.	**Living things and their habitats** classification, classification key, species, micro-organism, cell, fungus, mould, bacteria, virus.
Materials water, sand, mud, wet, dry.	**Everyday materials** wood, plastic, glass, metal, water, rock, hard, soft, smooth, rough, stretchy, stiff, bendy, shiny, dull	**Use of everyday materials** brick, paper, cardboard, fabric, foil, solid, squash, twist, stretch, absorbent, waterproof, transparent, elastic.	**Rocks** sediment, natural, fossil, organic, soil, compost, crystal, grainy, crumbly, permeable, durable, erosion.	**States of Matter** solid, liquid, gas, properties, particle, degrees Celsius, thermometer, oxygen, melt, freeze, heat, cool, boil, steam, evaporation, condensation, water cycle.	**Properties and changes of materials** dissolve, solution, solubility, electrical and thermal conductivity, transparency, sieve, filter reversible, irreversible.	
Earth, light & sound day, night, sun, moon, sound, loud, quiet, colour.	**Seasonal changes** season, summer, spring, autumn, winter, light, dark, temperature, wind, snow, ice, rain, cloud.		**Light** light source, shadow, transparent, opaque, translucent, reflect, mirror, block, protect, damage.	**Sound** vibrate, pitch, volume, wave.	**Earth and space** planet, star, Earth, Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto, dwarf planet, solar system, orbit, constellation.	**Light** colours, spectrum, ray, rainbow, filter, periscope.
Forces push, pull.			**Forces and magnets** force, contact, surface, magnetic, poles, attract, repel.	**Electricity** cell, bulb, wire, switch, buzzer, battery, motor, complete, circuit, conductor, insulator.	**Forces** air resistance, water resistance, friction, gravity, newton, lever, pulley, gear.	**Electricity** current, voltage, series circuit.
Working Scientifically look, feel, listen, what, why, where.	**Working Scientifically** question, answer, observe, test, record, identify, sort.		**Working Scientifically** compare, group, classify, measure, results, fair test, enquiry, predict, table, diagram, chart, pattern, conclusion, plan, present.		**Working Scientifically** Quantitative, variables, accuracy, precision, graph, explanation, evidence, research.	