Chilham Primary CEP School

Whole School Science Progression Map

September 2025

Introduction

This document details how each year group progress within the strands of the Science National Curriculum at Chilham School and is also a reference tool for teachers to use when planning to see what objectives the children need to be taught currently, what they have previously covered and what steps are next, to ensure no overlapping of curriculum content or teaching at different year group levels.

At Chilham CEP School, we use the Science PlanIt units of work from Twinkl for both Key Stage 1 and Key Stage 2. Science concepts are delivered to our mixed year classes to ensure coverage across our rolling 2 year cycle. Coverage is monitored to ensure there is progression in skills and knowledge across Key Stage 1 and Key Stage 2.

Intent

At Chilham Primary School, our intent is to spark and nurture every child's natural curiosity about the world through a rich, engaging, and inclusive Science curriculum. Rooted in our school's values of **Love, Trust, Respect, Honesty, Forgiveness, and Perseverance**, our Science teaching encourages children to explore, question, and discover with confidence and wonder.

We aim to provide a broad and balanced Science education that not only builds strong foundations in biology, chemistry, and physics, but also fosters a lifelong love of learning. Through hands-on, practical experiences and outdoor exploration in our beautiful rural surroundings, children are encouraged to observe, investigate, and reflect on the natural world around them. Our outdoor learning opportunities are a vital part of our curriculum, helping children to connect scientific concepts with real-life experiences in meaningful and memorable ways.

We want our children to be inspired by science and to develop a lifelong love and engagement in scientific concepts and learning. To support this, we introduce a diverse range of scientists and scientific role models, helping children to see that science is for everyone, regardless of background.

Our Science curriculum is coherently planned and sequenced to meet the needs of all learners. It supports the development of:

- **Scientific knowledge and conceptual understanding** across the disciplines of biology, chemistry, and physics.
- **Understanding of scientific processes and methods**, through a variety of enquiry types that help children ask and answer questions about the world.
- **Critical thinking and problem-solving skills**, enabling children to evaluate evidence, test ideas, and draw conclusions with integrity and honesty.

In line with our whole-school curriculum intent, Science at Chilham:

- Educates each child as a whole person, integrating academic, spiritual, creative, and cultural learning.

- Encourages children to become independent, enquiring, and collaborative learners.
- Provides challenge and opportunities for risk-taking, helping children to discover their talents and reach their full potential.
- Promotes respect for living things, the environment, and diverse scientific perspectives.
- Creates a safe and supportive space where mistakes are seen as part of the learning journey, and perseverance is celebrated.

Ultimately, we want our children to leave Chilham with a deep appreciation of the natural world, a strong foundation in scientific thinking, and the confidence to make positive contributions to their communities and the wider world.

By then end of EYFS, children will:

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.

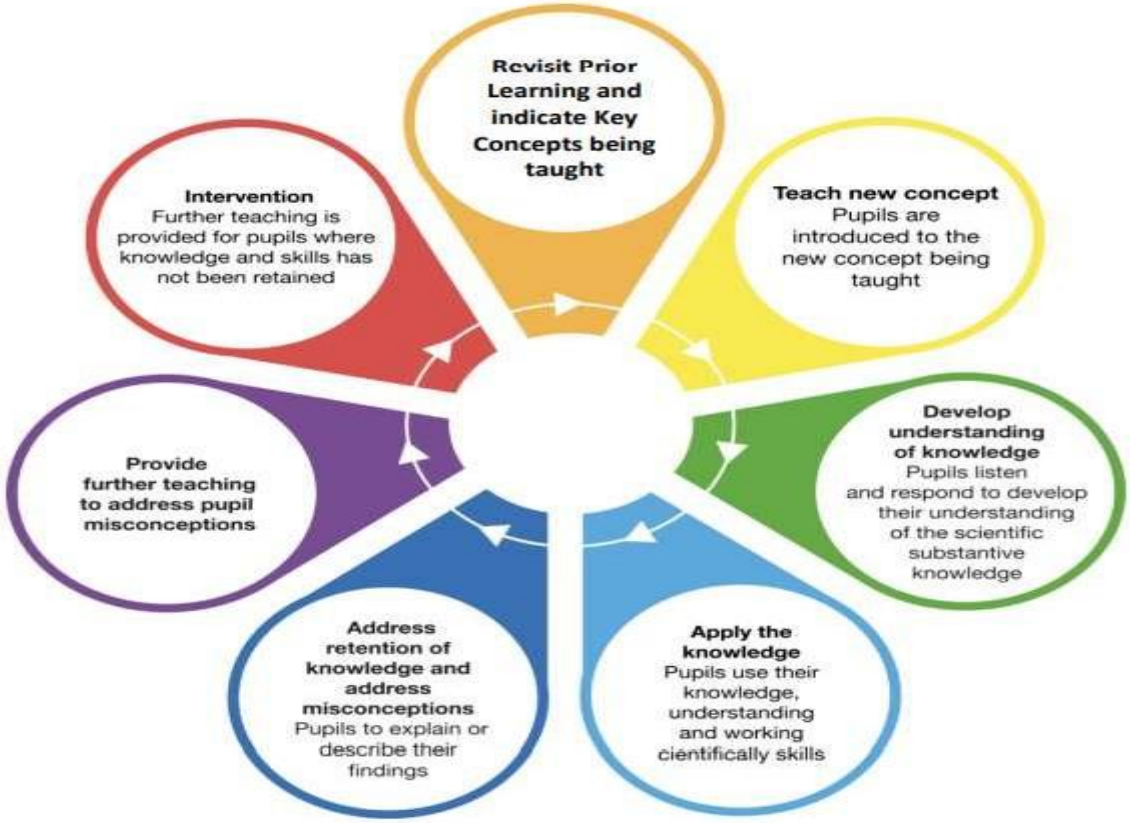
Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

By the end of Key Stage 1, children will:

By the end of KS1, basic fundamentals of the biology strand have been established. Pupils explore animals, humans and changes within environments and begin to develop simple scientific vocabulary linked to this. Children use different types of scientific enquiry to answer a range of questions. Children are encouraged to ask questions, discuss their findings and present their ideas in a variety of ways.

By the end of key stage 2, children will:

By the end of KS2, pupils have a deep understanding of a range of scientific ideas in Biology, Physics and Chemistry. Children are able to link scientific ideas to the world around them and, through research, understand how scientific ideas are developed over time. Children use secondary sources of information and purposeful, practical enquiry to draw conclusions and find things out.



Implementation

At Chilham, Science lessons will follow a teaching sequence incorporating the model below:

At Chilham, we strive to meet the needs of every child through adaptation of lessons and teaching resources. These may include:

- Words banks
- Focus vocabulary
- Pre Teaching to content
- Group work
- Manipulatives
- First hand experiences
- Chunking new knowledge
- Modelled examples
- Movement breaks
- Well prepared resources

Principles of Science at Chilham

- Teachers promote enjoyment and foster interest of the scientific concepts; Biology, Chemistry and Physics. These spiral concepts allow a depth of understanding to develop and progression through the primary phase.
- Substantive and Disciplinary knowledge (Conceptual and Procedural) are incorporated into lessons using the following model:

	Substantive National Curriculum knowledge statements	**Disciplinary** National Curriculum working scientifically statements
Conceptual Things pupils need to understand	Knowledge statements	Working scientifically statements that **cannot** be performed without conceptual knowledge
Procedural Things pupils need to be able to do	Knowledge statements that involve procedures that **cannot** be performed without conceptual knowledge	Working scientifically statements that involve procedures that are generic and **can** be performed without conceptual knowledge

- Children approach investigations with the relevant conceptual and procedural understanding, facilitated through teaching, to complete the task accurately and to avoid misconceptions. Pupils learn how to: plan an investigation, make observations over time, seek patterns, identify, classify and group, ensure comparative and fair testing, research through secondary sources and analyse and present findings.

- Children present their findings and learning using science specific language, observations and diagrams.
- In order to support children in their ability to 'know more and remember more' there are regular opportunities to review the learning taken place in previous topics as well as previous lessons. 'Concept Cartoons' are used to produce discussion at the start of a lesson and to assess misconceptions and prior knowledge.
- At the start of each topic children will review previous learning and will have the opportunity to share what they already know about a current topic through 'Knowledge Mind-Maps'. These are reviewed at the end of the unit of work. Key vocabulary to explore is presented to the children.
- Children are given a 'knowledge organiser' at the start of each topic which details some key Science Curriculum Statement information, dates and vocabulary. This is not used as part of an assessment, but to support children with their acquisition of knowledge and are used as a reference document.

- Effective CPD and standardisation opportunities are available to staff to ensure high levels of confidence and knowledge are maintained.
- Effective use of education visits and visitors are planned, to enrich and enhance the pupil's learning experiences within the Science curriculum.

- Teachers use highly effective assessment for learning in each lesson to ensure misconceptions are highlighted and addressed. These include quizzes.
- Effective modelling by teachers ensures that children are able to achieve their learning intention, with misconceptions addressed promptly within it.
- Through using a range of assessment tools, adaptations are facilitated by teachers, to ensure that each pupil can access the Science curriculum.
- Children are provided with a series of learning objectives which develop their knowledge and understanding of scientific concepts.
- Pupils are regularly given the opportunity for self or peer assessment, which will then be used to inform planning, preparation, adaptations and address misconceptions within that lesson, or for the next lesson.
- Where appropriate, cross-curricular links are planned for, with other subjects such as Maths, English and Computing.
- End of unit assessment quizzes inform teacher assessment and data drops are collected 3 times a year and recorded on an assessment grids.
- Moderation of work and monitoring by the Subject Leader take place 3 times a year.

Impact

The impact of this curriculum design will support strong progress over time, across key stages, relative to a child's individual starting point and their progression of skills. Children will therefore be expected to leave Chilham reaching at least age-related expectations for Science. Through various workshops, trips and interactions with experts our Science curriculum will lead pupils to be enthusiastic Science learners and understand that science has changed our lives and that it is vital to the world's future prosperity. We want to empower our children so they understand they have the capability to change the world. This is evidenced in a range of ways, including pupil voice, their work, assessments, staff moderation and in pupil voice. Progress is measured through termly data-drops of science and identifying next steps for pupils working below expectations. Progress is reported to parents 3 times a year. The Science lead and T&L governors monitor the impact of science throughout the academic year.

Chilham Curriculum Overview Cycle A

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Wrens EYFS	**Into the woods**	**Celebrations**	**Travel and Transport**	**Fairy Tales**	**People who help us in our village**	**Animals**
Herons Yr1 + Yr2	Our School	Our Local Area	The Great Fire of London	Wonderful Weather	Our Country	Our World Living Things and where they live
	Science: Physics *Seasonal Changes (Autumn and Winter)*		**Science: Physics** *Seasonal Changes (Spring and Summer)*		**Science: Biology** *Animals Including Humans Animals, Living things & Habitats*	
Martins Yr3 + Yr 4	Postcards Home	Riotous Royalty	Ancient Egypt	Volcanoes	Earthquakes	Scots and Anglo Saxons
	Science: Physics *T1:Sound*		**Science: Biology** *T3:Living things and Their Habitats*		**Science: Biology** *Plants*	
	T2: Light		**Science: Physics** *T4:Electricity*			
Peacocks Yr 5 + Yr	Crime and Punishment	Homefront Britain (WW2)	The Americas North	Global Trade	Ancient Greece	Marvellous Maps

6	**Science: Chemistry** *T1: Properties and Changes of Materials*	**Science: Biology** *T1: Animals Including Humans (Year 5)*	**Science: Physics** *Forces (Year 5)*
	Science: Physics *T2: Light (Year 6)*	*T2: Living things and their Habitats (Year 5)*	

Chilham Curriculum Overview Cycle B

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Wrens EYFS	**Into the woods**	**Celebrations**	**Travel and Transport**	**Fairy Tales**	**People who help us in our village**	**Animals**
Herons Yr1 + Yr2	Sensational Safari	Let's go to China!	Kings and Queens	Significant Explorers	Toys	Seaside Holidays
	Science: Chemistry *Everyday Materials* *Uses of Everyday Materials*		**Science: Biology** *Animals including Humans (Year1+2)*		**Science: Biology** *Plants*	
Martins Yr3 + Yr 4	Stone Age to Iron Age	All Around the World	The Rainforest	Water	The Romans	Land Use
	Science: Physics *Forces and Magnets*		**Science: Chemistry** *T3: Rocks and Solids (Year 3)* *T4: States of Matter (Year 4)*		**Science: Biology** *Animals Including Humans and Skeletons* *(Year 3 and Year 4)*	

<table>
<tr><td rowspan="4">Peacocks

Yr 5 + Yr 6</td><td>Mountains</td><td>Rivers</td><td>Exploring Eastern Europe</td><td>Mysteries of the Maya</td><td>The Vikings</td><td>Canterbury</td></tr>
<tr><td colspan="2">Science: Biology

Living Things and Habitats
(Year 6)</td><td colspan="2" rowspan="3">Science: Physics

Earth and Space
(Year 5)</td><td colspan="2">Science: Biology

Evolution and Inheritance
(Year 6)</td></tr>
<tr><td colspan="2">Science: Physics

Electricity
(Year 6)</td><td colspan="2">Animals Including Humans
(Year 6)</td></tr>
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Big Ideas in Science

We have used the Science National Curriculum and Key stage expectations to plan our Science Curriculum. Through their learning in Key Stage 1 all children will develop their scientific knowledge and conceptual understanding through the different disciplines of biology, physics and chemistry. In Key Stage 2 children will continue to develop their scientific knowledge and understanding within these disciplines and will be able to interconnect their learning within each discipline to make sense of the world around them. Referring to the Big Ideas of Science as part of our teaching in Key Stage 2 enables children to revisit the ideas within each discipline, make meaningful connections between their learning in Science and understand the how and why of some of the phenomena they experience in the world around them occurs. This will enable them to answer questions and will equip them with the scientific knowledge require to understand the uses and implications of science, now and for the future.

Big Ideas of Science	Biology	Physics	Chemistry
	• Organisms are organised on a cellular basis and have a finite life span. • Organisms require a supply of energy and materials for which they depend on, or compete with, other organisms. • Genetic information is passed down from one generation of organisms to another. • The diversity of organisms, living and extinct, is the result of evolution.	• Objects can affect other objects at a distance. • Changing the movement of an object requires a net force to be acting upon it. • The total amount of energy in the universe is always the same but can be transferred from one energy store to another during an event. • Our solar system is a very small part of one of billions of galaxies in the universe.	• All matter in the universe is made from very small particles. • The composition of the Earth and its atmosphere, and the processes occurring within them, shape the Earth's surface and its climate.

Science in EYFS at Chilham School

At Chilham School children in the Reception year follow the Early Years Foundation Stage Curriculum. Science falls into the Early Learning Goal – Understanding The World – The Natural World and children at the expected level of development will:

Communication and Language:

- **Listening and Attention**

  - Make comments about what they have heard and ask questions to clarify their understanding

Personal, Social and Emotional Development

- **Managing Self**

  - Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.

Understanding the World

- **The Natural World**

  - 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 importance processes and changes in the natural world around them, including the seasons and changing states of matter.

In addition these and in readiness for Year 1 we provide opportunities for children to develop further diciplinary knowledge of Science. This may include:

- Knowledge of scientific methods such as patterns and classification
- Knowledge of apparatus and techniques such as measuring and safety
- Knowledge of how science uses evidence to develop explanations such as conclusions and peer discussions

The Reception classroom is designed so that during daily sustained periods of Independent Learning, children are able to develop their skills, understanding

and knowledge towards the goals above. We have areas which are permanent features of the continuous provision in the Early Years environment; resources within them may be part of our enhanced provision which cater for the learning needs and may change over time based upon the observations and assessments that the adults make of the children whilst engaged in play, in order to enable the children to move forward in their learning.

The children in the Reception class make frequent use of the outdoor area, school grounds and local environments. Such learning opportunities will be planting, growing and caring for sunflowers, exploring seasonal change by observing our trees at different stages in the year, hunting for minibeasts at varying times of the year and visiting areas amongst many other things. Through the use of high quality texts, videos and trips, throughout the year children have further opportunities to make comparisons to different places. Children in the reception year also have the opportunity to observe and care for butterflys in the spring term to develop their knowledge and understanding of animals and life cycles.

Significant contributers within the field of Science

Year 1

- **Charles Macintosh** – *Everyday Materials*: Invented the modern waterproof raincoat.
- **Charlotte McCurdy** – *Everyday Materials*: Designer blending science and design to address climate change.
- **David Attenborough** – *Animals, including Humans*: Naturalist and broadcaster known for wildlife documentaries.
- **Steve Backshall** – *Animals, including Humans*: Explorer and presenter of *Deadly 60*.
- **David Douglas** – *Plants*: Botanist who introduced non-native conifers to Britain.
- **Alan Titchmarsh** – *Plants*: Gardener and broadcaster awarded an MBE for horticulture.
- **Robert Fitzroy** – *Seasonal Changes*: Founder of the Met Office; created the first public weather forecast.
- **Carol Kirkwood** – *Seasonal Changes*: BBC weather presenter trained by the Met Office.

Year 2

- **Jacques Cousteau** – *Living Things and Their Habitats*: Ocean explorer who popularized marine biology.
- **David Attenborough** – *Living Things and Their Habitats*: (Repeated from Year 1)
- **Caroline Haslett** – *Uses of Everyday Materials*: Electrical engineer and advocate for girls in science.
- **Stella McCartney** – *Uses of Everyday Materials*: Fashion designer promoting sustainable materials.
- **Florence Nightingale** – *Animals, including Humans*: Nurse who revolutionized hygiene in hospitals.
- **Bear Grylls** – *Animals, including Humans*: Adventurer known for survival skills.
- **Jane Colden** – *Plants*: First known American female botanist.
- **David Hickmott** – *Plants*: Seed collections assistant at the Millennium Seed Bank.

Year 3

- **Leonardo da Vinci** – *Forces and Magnets*: Conducted early experiments on friction.
- **Masato Sagawa** – *Forces and Magnets*: Invented the strongest permanent magnet.
- **Thomas Edison** – *Light*: Invented the first working electric light bulb.
- **Isamu Akasaki** – *Light*: Co-inventor of energy-efficient LEDs.
- **Mary Anning** – *Rocks*: Fossil hunter who discovered several dinosaur specimens.
- **Sanjeev Gupta** – *Rocks*: Geologist studying Earth and planetary landscapes.
- **George Washington Carver** – *Plants*: Promoted crop rotation and soil conservation.
- **Luciano Scandian** – *Plants*: Researcher on honeybee health.
- **Louis Pasteur** – *Animals, including Humans*: Discovered pasteurization and germ theory.
- **Charlotte Armah** – *Animals, including Humans*: Scientist studying how food affects disease prevention.

Year 4

- **Alexander Graham Bell** – *Sound*: Invented the telephone.
- **Jaap Haartsen** – *Sound*: Inventor of Bluetooth technology.
- **Anders Celsius** – *States of Matter*: Created the Celsius temperature scale.
- **Heston Blumenthal** – *States of Matter*: Chef known for experimental cooking and food science.
- **Benjamin Franklin** – *Electricity*: Proved lightning is a form of electricity.
- **Erik Bystrup** – *Electricity*: Designed modern T-shaped electricity pylons.
- **Pierre Fauchard** – *Animals, including Humans*: Known as the father of modern dentistry.
- **Zhaoming Liu** – *Animals, including Humans*: Researcher into tooth enamel regeneration.
- **Carl Linnaeus** – *Living Things and Their Habitats*: Developed the modern system of taxonomy.
- **Vanessa Nakate** – *Living Things and Their Habitats*: Climate activist campaigning to save rainforests.

Year 5

- **Alexander Fleming** – *Animals, including Humans*: Discovered penicillin.
- **Rosalind Franklin** – *Earth and Space*: Contributed to the discovery of DNA structure.
- **Nicolaus Copernicus** – *Earth and Space*: Proposed the heliocentric model of the solar system.
- **Tim Peake** – *Earth and Space*: British astronaut and spacewalker.
- **Isaac Newton** – *Forces*: Formulated the laws of motion and gravity.
- **Elon Musk** – *Forces*: Entrepreneur behind SpaceX and Tesla.
- **Albert Einstein** – *Properties and Changes of Materials*: Developed the theory of relativity.
- **Hugh Bradner** – *Properties and Changes of Materials*: Invented the neoprene wetsuit.
- **Gregor Mendel** – *Living Things and Their Habitats*: Discovered the basic principles of heredity.
- **Jane Goodall** – *Living Things and Their Habitats*: Primatologist known for her work with chimpanzees.

Year 6

- **Carl Linnaeus** – *Living Things and Their Habitats*: (Repeated from Year 4)
- **Tanesha Williams** – *Living Things and Their Habitats*: Botanist studying plant responses to climate change.
- **Charles Darwin** – *Evolution and Inheritance*: Developed the theory of evolution by natural selection.
- **Sylvia Earle** – *Evolution and Inheritance*: Marine biologist and deep-sea explorer.
- **Nikola Tesla** – *Electricity*: Developed the AC electricity system.
- **M. Stanley Whittingham** – *Electricity*: Developed the lithium-ion battery; Nobel Prize winner.
- **Ibn al-Haytham** – *Light*: Proved that light travels in straight lines.
- **Jo Shien Ng** – *Light*: Researcher in electro-optical detection.
- **William Harvey** – *Animals, including Humans*: Described the circulation of blood.
- **Donald Palmer** – *Animals, including Humans*: Researcher in immunology.

Coverage of Units

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Biology	Animals including Humans	✓	✓	✓	✓	✓	✓
	Plants	✓	✓	✓			
	Living Things and Their Habitats		✓		✓	✓	✓
	Evolution and Inheritance						✓
Physics	Seasonal Changes	✓					
	Forces			✓ Forces and Magnets		✓ Forces	
	Light			✓			✓
	Sound				✓		
	Earth and Space					✓	
	Electricity				✓		
Chemistry	Materials	✓ Everyday Materials	✓ Use of materials	✓ Rocks	✓ States of Matter	✓ Properties and Changes of Materials	

	Scientists and Inventors	✓	✓	✓	✓	✓	✓

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
BIOLOGY	**Animals including Humans**	**Pupils should be taught to:** • 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.	**Pupils should be taught to:** • 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.	**Pupils should be taught to:** • 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.	**Pupils should be taught to:** • 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.	**Pupils should be taught to:** • describe the changes as humans develop to old age.	**Pupils should be taught to:** • 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.

	Vocabulary Progression	• Names of animal groups: **fish, amphibians, reptiles, birds, mammals.** • Animal diets: **carnivore, herbivore, omnivore.** • Human and animal body parts: e.g. body, head, neck, arms, elbows, legs, knees, face, ears, eyes, nose, hair, mouth, teeth, hands, feet, tail, wings, feathers, fur, beak, fins, gills. • Human senses: **sight, hearing, touch, smell, taste.** • Exploring senses: loud, quiet, soft, rough. • Other: human, animal, pet.	• Being born and growing: **Young, offspring, live young**, grow, **develop**, change, hatch, lay, fly, crawl, talk. • Young and adult names: e.g. lamb and sheep, kitten and cat, duckling and duck. • **Life cycle** stages: e.g. baby, toddler, child, teenager, **adult;** frogspawn, tadpole, froglet, frog. • Survival and staying healthy: basic needs, survive, food, air, **exercise, diet, nutrition**, healthy, balanced diet, **hygiene, germs.** • Food groups: fruit and vegetables, proteins, dairy and alternatives, carbohydrates, oil and spreads, fat, salt, sugar. Previously introduced vocabulary: **water**.	• Food groups and **nutrients**: fibre, fats **(saturated and unsaturated**), vitamins, minerals. • Skeletons and muscles: skeleton, **muscles, tendons, joints,** protection, support, organs, voluntary muscles, involuntary muscles, biceps, triceps, contract, relax, bone, cartilage, shell, **vertebrate, invertebrate,** endoskeleton, exoskeleton, hydrostatic skeleton. • Names of human bones: e.g. skull, spine, backbone, vertebral column, ribcage, pelvis, clavicle, scapula, humerus, ulna, pelvis, radius, femur, tibia, fibula. • Other: **energy**. Previously introduced vocabulary: movement.	• Digestive system: **digest**, digestion, tongue, teeth, saliva, salivary glands, **oesophagus, stomach,** liver, pancreas, gall bladder, **small intestine,** duodenum**, large intestine, rectum,** anus, faeces, organ. • Types of teeth and dental care: **molar**, **premolar**, **incisor**, **canine**, wisdom teeth, tooth decay, plaque, enamel, baby (milk) teeth. • Food chains and animal diets: decomposer, food web. Previously introduced vocabulary: **producer,** consumer**, prey, predator,** excretion**,** habitat.	• Process of reproduction: **gestation, asexual reproduction, sexual reproduction,** sperm, egg, cells, clone. • Changes and **life cycle:** embryo, foetus, uterus, **prenatal, adolescence, puberty, menstruation, adulthood,** menopause, **life expectancy,** old age, hormones, sweat. • Changing body parts: e.g. breasts, penis, larynx, ovaries, genitalia, pubic hair. Previously introduced vocabulary: reproduction, **reproduce,** types of animals and animal groups, **fertilisation.**	• **Circulatory system**: circulation, **heart**, pulse, heartbeat, heart rate, lungs, breathing, **blood vessels**, blood, pump, transported, **oxygenated blood, deoxygenated blood,** oxygen, arteries, veins, capillaries, chambers, plasma, platelets, white blood cells, red blood cells. • Lifestyle: **drug, alcohol,** smoking, disease, calorie, energy input, energy output. • Other: water transportation, nutrient transportation, waste products. Previously introduced vocabulary: carbon dioxide.

		Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
BIOLOGY	**Plants**	**Pupils should be taught to:** • 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.	**Pupils should be taught to:** • 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.	**Pupils should be taught to:** • 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.			
	Vocabulary Progression	• Names of common plants: **wild plant, garden plant, evergreen** tree, **deciduous** tree, common flowering plant, **weed,** grass. • Name some features of plants: e.g. **flower**, vegetable, **fruit**, berry, **leaf/leaves**, blossom, **petal**, **stem**, trunk, branch, **root**, **seed, bulb,** soil. • Name some common types of plant e.g. sunflower, daffodil.	• Growth of plants: **germination**, **shoot, seed dispersal,** grow, food store, life cycle, die, wilt, seedling, sapling. • Needs of plants: **sunlight, nutrition,** light, healthy, space, air. • Name different types of plant: e.g. bean plant, cactus. • Names of different habitats: e.g. rainforest, desert. Previously introduced vocabulary: **water**, **temperature**, warm, hot, cold, habitat.	• Water transportation: transport, **evaporation, evaporate, nutrients,** absorb, anchor. • Life cycle of flowering plants: **pollination** (insect/wind), pollen, nectar, pollinator, seed formation, **seed dispersal** (animal/wind/water), reproduce, **fertilisation,** fertilise, **stamen,** anther, filament, **carpel (pistil),** stigma, style, ovary, ovule, **sepal**, carbon dioxide. Previously introduced vocabulary: life cycle**.** .			
		Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**

BIOLOGY	**Living Things and Their Habitats**		**Pupils should be taught to:** • 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.		**Pupils should be taught to:** • 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.	**Pupils should be taught to:** • 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.	**Pupils should be taught to:** • describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals; • give reasons for classifying plants and animals based on specific characteristics.

	Vocabulary Progression		• Living or dead**: living, dead, never living,** not living, alive, never been alive, healthy. • **Habitats** including **microhabitats**: **depend,** shelter, safety, **survive**, suited, space, minibeast, air. • **Life processes:** movement, sensitivity, growth, reproduction, nutrition, excretion, respiration. • **Food chains: food sources,** food, producer, consumer, predator, prey. • Names of habitats and microhabitats: e.g. under leaves, woodland, rainforest, sea shore, ocean, urban, local habitat. Previously introduced vocabulary: senses, **carnivore**, **herbivore**, **omnivore**, **seed**, **water**, names of materials.		• Living things: **organisms, specimen,** species. • Grouping living things: **classification,** classification keys, classify, **characteristics**. • Names of invertebrate animals: snails and slugs, worms, spiders, insects. • Invertebrate body parts: e.g. wing case, abdomen, thorax, antenna, segments, mandible, proboscis, prolegs. • Environmental changes: **environment,** environmental dangers, adapt, natural changes, climate change, deforestation, pollution, urbanisation, invasive species, **endangered species, extinct.** Previously introduced vocabulary: carbon dioxide, **fish, bird, mammal, amphibian, reptile**, skeleton, bone, **vertebrate, invertebrate,** backbone, names for animal body parts, names of common plants, photosynthesis.	• **Reproduction**: **asexual reproduction, sexual reproduction**, **gestation, metamorphosis,** gametes, tuber, runners/side branches, plantlet, cuttings, embryo, adolescent, penis, vagina, egg, pregnancy, gestation. Previously introduced vocabulary: **life cycle, pollination,** offspring, **fertilise,** fertilisation, sepal, filament, anther, stamen, pollen, petal, stigma, style, ovary, carpel, ovule, stem, bulb, roots, mammal, adult, baby, sperm, cells, live young.	• Classifying: Carl Linnaeus, Linnaean system, flowering and non-flowering plants, variation. • **Microorganisms**: **bacteria,** single-celled, microbes, microscopic, virus, fungi, fungus, mould, antibiotic, yeast, ferment, **microscope**, decompose.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6

BIOLOGY	Evolution and Inheritance		•				**Pupils should be taught to:** • 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.
	Vocabulary Progression						• **Evolution** and **inheritance:** evolve, **adaptation,** inherit, **natural selection, adaptive traits, inherited traits,** mutations, theory of evolution, ancestors, biological parent, chromosomes, genes, Charles Darwin. • Other: selective breeding, artificial selection, breed, cross breeding, genetically modified food, cloning, DNA. Previously introduced vocabulary: classification, **offspring, characteristics, habitat, environment,** adapt, **variations**, human, **fossil,** suited, cells, names of different habitats, names of animals and their body parts, species, **sedimentary rock**, lava, **igneous rock**, **metamorphic rock**, **magma**, heat, **fossilisation**.

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
PHYSICS	**Seasonal Changes**	**Pupils should be taught to:** • observe changes across the 4 seasons; • observe and describe weather associated with the seasons and how day length varies.	•				
	Vocabulary Progression	• **Seasons**: **spring, summer, autumn, winter**, seasonal change. • **Weather**: e.g. sun, rain, snow, sleet, frost, ice, fog, cloud, hot/warm, cold, storm, wind, thunder, weather forecast.					
		• Measuring weather: temperature, rainfall, wind direction, thermometer, rain gauge. • Day length: night, day, **daylight.**					

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
PHYSICS	**Forces**		•	Forces and Magnets **Pupils should be taught to:** • compare how things move on different surfaces; • notice that some forces need contact between 2 objects, but magnetic forces can act at a distance; • observe how magnets attract or repel each other and attract some materials and not others; • compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials; • describe magnets as having 2 poles; • predict whether 2 magnets will attract or repel each other, depending on which poles are facing.		Forces **Pupils should be taught to:** • 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.	

	Vocabulary Progression			• <u>How things move:</u> move, movement, **surface**, distance, strength. • <u>Types of **forces**:</u> push, pull, contact force, non-contact force, **friction**. • **<u>Magnets:</u> magnetic, magnetic field,** magnetic force, bar magnet, horseshoe magnet, ring magnet, magnetic **poles** (north pole, south pole), **attract, repel,** compass. • <u>Magnetic and non-magnetic materials</u>: e.g. iron, nickel, cobalt. Previously introduced vocabulary: metal, names of materials.		• <u>Types of forces:</u> **air resistance, water resistance, buoyancy, upthrust,** Earth's **gravitational pull, gravity**, opposing forces, driving force. • **<u>Mechanisms:</u>** levers, pulleys, gears/cogs. • <u>Measurements:</u> **weight, mass,** kilograms (kg), Newtons (N), scales, speed, fast, slow. • <u>Other:</u> **streamlined**, Earth. Previously introduced vocabulary: air, heat, moon.	

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
PHYSICS	**Light**		•	**Pupils should be taught to:** • 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			**Pupils should be taught to:** • 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;
				light source is blocked by an opaque object; • find patterns in the way that the size of shadows change.			• use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.

	Vocabulary Progression			• **Light** and seeing: **dark,** absence of light, **light source,** illuminate, visible, **shadow, translucent,** energy, block. • **Light sources:** e.g. candle, torch, fire, lantern, lightning. • **Reflective light: reflect, reflection,** surface, **ray**, scatter, reverse, beam, angle, mirror, moon. • Sun safety: dangerous, glare, damage, UV light, UV rating, sunglasses, direct. Previously introduced vocabulary: **opaque, transparent,** sunlight, sun.			• Reflection: periscope. • Seeing light: **visible spectrum, prism.** • How light travels: light waves, wavelength, straight line, **refraction.** Previously introduced vocabulary: names and properties of materials, absorb.

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
PHYSICS	**Sound**		•		**Pupils should be taught to:** • 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.		
	Vocabulary Progression				• Parts of the **ear**: **eardrum.** • Making sound: **vibration,** vocal cords, **particles.** • Measuring sound: **pitch**, **volume, amplitude, sound wave,** quiet, loud, high, low, travel**, distance.** • Other: **soundproof, absorb sound.**		

	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**

PHSYICS	**Earth and Space**		•			**Pupils should be taught to:** • 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.	
	Vocabulary Progression					• Solar system: **star, planet.** • Names of planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Neptune, Uranus. • Shape: **spherical bodies, sphere.** • Movement: **rotate, axis, orbit, satellite.** • Theories: **geocentric model, heliocentric model, astronomer.** • Day length: sunrise, sunset, midday, time zone. Previously introduced vocabulary: **Sun, moon, shadow**, day, night, heat, **light**, **reflect**.	

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
PHYSICS	Electricity		•		**Pupils should be taught to:** • 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		**Pupils should be taught to:** • 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

					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.	
	Vocabulary Progression				• **Electricity:** mains-powered, battery-powered, **mains electricity,** plug, **appliances**, devices. • Circuits: **circuit,** simple series circuit, complete circuit, incomplete circuit. • Circuit parts: bulb, cell, wire, buzzer, switch, motor, **battery.** • Materials: **electrical conductor, electrical insulator.** • Other: safety. Previously introduced vocabulary: names of materials.	

		Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**
CHEMISTRY	**Materials**	Everyday Materials **Pupils should be taught to:** • 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	Use of Everyday Materials **Pupils should be taught to:** • identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses; • find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	Rocks **Pupils should be taught to:** • 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.	States of Matter **Pupils should be taught to:** • 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	Properties and Changes of Materials **Pupils should be taught to:** • compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets; • know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution;

bulbs, the loudness of buzzers and the on/off position of switches;

- use recognised symbols when representing a simple circuit in a diagram.

- Flow and measure of electricity: **voltage, amps, resistance, electrons**, volts (V), **current.**
- Circuits**: symbol,** circuit diagram, component, function, filament.
- Variations: dimmer, brighter, louder, quieter.
- Types of electricity: natural electricity, human-made electricity, solar panels, power station.
- Other: positive, negative.

Year 6

		the basis of their simple physical properties.			rate of evaporation with temperature.	• 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.	
	Vocabulary Progression	• Names of **materials**: wood, plastic, glass, metal, water, rock, paper, cardboard, rubber, fabric. • Properties of materials: **hard, soft, shiny, dull, stretchy**, **rough**, **smooth, bendy, not bendy, transparent, opaque, waterproof, not waterproof**, **absorbent, not absorbent,** sharp, stiff. • Other: **object.**	• Changing shape: squash, bend, twist, stretch. • **Properties** of **materials:** e.g. strong, flexible, light, hard-wearing, elastic. • Other: **suitability**, recycle, pollution.	• Types of rock**: sedimentary rock, igneous rock, metamorphic rock.** • **Properties of rocks: permeable,** semi-permeable, **impermeable,** durable. • Names of rocks: e.g. marble, chalk, granite, sandstone, slate. • Formation of rocks and fossils: natural, human-made, **magma, lava,** molten rock, **sediment, erosion, fossilisation,** layers, bone, fossil. • Soil: sandy, chalky, clay, peaty, loamy, topsoil, subsoil, bedrock, mineral, organic matter, compost. • Other: **palaeontology.** Previously introduced vocabulary: soil, **water**, air	• **States of matter: solids, liquids, gases,** particles. • State change: **evaporate, condense, melt, freeze**, heat, cool, melting point, freezing point, boiling point, **water vapour**. • Water cycle: **precipitation**, evaporation, condensation, ground run-off, collection, underground water, bodies of water (sea, river, stream), water droplets, hail. • Other: atmosphere. Previously introduced vocabulary: temperature, rain, cloud, snow, wind, sun, hot, cold, absorb, carbon dioxide	• Properties of **materials**: thermal **conductor/insulator,** magnetism, electrical resistance, **transparency**. • Mixtures and solutions: dissolving, substance, soluble, insoluble. • Changes of materials: reversible change, physical change, irreversible change, chemical change, burning, new material, product. • Separating: sieving, filtering, magnetic attraction. Previously introduced vocabulary: electrical **conductor/insulator,** bulb, **translucent**.	

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Big Idea End Points	**Pupils should be taught to:** • identify and name a variety of common wild and garden plants, including deciduous and evergreen trees; • describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets);	**Pupils should be taught to:** • find out and describe how plants need water, light and a suitable temperature to grow and stay healthy; • describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and	**Pupils should be taught to:** • explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant; • identify that humans and some other animals have skeletons and muscles for	**Pupils should be taught to:** • recognise that environments can change and that this can sometimes pose dangers to living things; • identify the different types of teeth in humans and their simple functions; • compare and group materials together, according to whether	**Pupils should be taught to:** • describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird; • compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency,	**Pupils should be taught to:** • give reasons for classifying plants and animals based on specific characteristics; • identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood;
	• identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense; • 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; • observe and describe weather associated with the seasons and how day length varies.	identify and name different sources of food; • describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene; • 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 about people who have developed new materials (non-statutory).	support, protection and movement; • 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; • notice that light is reflected from surfaces; • observe how magnets attract or repel each other and attract some materials and not others. •	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); • recognise that vibrations from sounds travel through a medium to the ear; • 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; • recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. •	conductivity (electrical and thermal), and response to magnets; • use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating; • describe the movement of the Earth, and other planets, relative to the Sun in the solar system; • find out about the work of naturalists and animal behaviourists (non-statutory); • describe how scientific ideas have changed over time (non-statutory). •	• recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function; • recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago; • use recognised symbols when representing a simple circuit in a diagram.

Working Scientifically

EYFS working Scientifically

(Statements taken from Development Matters for Three and Four Year olds and children in Reception as well as ELG's)

	Communication and Language	• Understand why questions, like "Why do you think the caterpillar got so fat?"
	Personal, Social and Emotional Development	• Make healthy choices about food, drink, activity and tooth brushing

Three and Four Year Olds	**Understanding the World**	• Use all their senses in hands-on exploration of natural materials. • Explore collections of materials with similar and/or different properties • Talk about what they see, using a wide vocabulary. • Begin to make sense of their own life-story and family's history • Explore how things work • Plant seeds and care for growing plants • Understand the key features of the life cycle of a plant and animal • Begin to understand the need to respect and care for the natural environment and all living things • Explore and talk about different forces they can feel • Talk about the differences between materials and changes they notice.

Reception	**Communication and Language**	• Learn new vocabulary • Ask questions to find out more and to check what has been said to them • Articulate their ideas and thoughts in well-formed sentences • Describe events in some detail • Use talk to help work out problems and organise thinking and activities, and explain how things work and why they might happen. • Use new vocabulary in different contexts.
	Personal, Social and Emotional Development	• Know about the different factors that support overall health and wellbeing: - Regular physical activity - Healthy eating - Toothbrushing - Sensible amounts of 'screen time' - Having a good sleep routine - Being a safe pedestrian

	Understanding the World	• Explore the natural world around them • Describe what they see, hear and feel while they are outside • Recognise some environments that are different to the one in which they live • Understand the effect of changing seasons on the natural world around them.
	Communication and Language	• Make comments about what they have heard and ask questions to clarify their understanding.

Early Learning Goal	**Personal, Social and Emotional Development**	• Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.
	Understanding the World	• 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.

KS1 National Curriculum working Scientifically end points

During years 1 and 2, pupils will be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- asking simple questions and recognising that they can be answered in different ways;
- observing closely, using simple equipment;
- performing simple tests;

- identifying and classifying;
- using their observations and ideas to suggest answers to questions;
- gathering and recording data to help in answering questions.

Lower KS2 National Curriculum working Scientifically end points	Upper KS2 National Curriculum working Scientifically end points

During years 3 and 4, pupils will be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: • asking relevant questions and using different types of scientific enquiries to answer them; • setting up simple practical enquiries, comparative and fair tests; • making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers; • gathering, recording, classifying and presenting data in a variety of ways to help in answering questions; • recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables; • reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions; • using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions; • identifying differences, similarities or changes related to simple scientific ideas and processes; • using straightforward scientific evidence to answer questions or to support their findings.	During years 5 and 6, pupils will ko Ommmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmm mmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmm mmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmm mmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmm mmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmm mmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmm mmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmm mmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmm mmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmm mmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmm mmmmmmmmmmmmmmmmmmmmmmmmmllllllllllllllllllllllllllllllllllllllll llllllllllllllllllllllllllllllllllllll]’[e taught to use the following practical 71@scientific methods, processes and skills through the teaching of @}the programme of study content:@@@@@@@@@@@}@@@@{@@@{@@@@@@@@@ @@@@@@@@@@@@@@@{{{{{{{{@{{{{ bv[kjkl;# # • planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary; • taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate; • recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs; • using test results to make predictions to set up further

	comparative and fair tests; • reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations; • identifying scientific evidence that has been used to support or refute ideas or arguments.

	KS1	Lower KS2	Upper KS2
Plan	**KS1 Science National Curriculum** Asking simple questions and recognising that they can be answered in different ways. Children can: a explore the world around them, leading them to ask some simple scientific questions about how and why things happen; b begin to recognise ways in which they might answer scientific questions; c ask people questions and use simple secondary sources to find answers.	**Lower KS2 Science National Curriculum** Asking relevant questions and using different types of scientific enquiries to answer them. Children can: a start to raise their own relevant questions about the world around them in response to a range of scientific experiences; b start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; c recognise when a fair test is necessary; d help decide how to set up a fair test, making decisions about what observations to make, how long to make them for and the type of simple equipment that might be used.	**Upper KS2 Science National Curriculum** Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Children can: a with growing independence, raise their own relevant questions about the world around them in response to a range of scientific experiences; b with increasing independence, make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; c explore and talk about their ideas, raising different kinds of scientific questions; d ask their own questions about scientific phenomena; e select and plan the most appropriate type of scientific enquiry to use to answer scientific questions; f make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them; g plan, set up and carry out comparative and fair tests to answer questions, including recognising and controlling variables where necessary.

	KS1	Lower KS2	Upper KS2

Do	**KS1 Science National Curriculum** Observing closely, using simple equipment. Performing simple tests. Identifying and classifying. Children can: a observe the natural and humanly-constructed world around them; b observe changes over time; c use simple measurements and equipment; d make careful observations, sometimes using equipment to help them observe carefully; e carry out simple practical tests, using simple equipment; f experience different types of scientific enquiries, including practical activities; g talk about the aim of scientific tests they are working on; h use simple features to compare objects, materials and living things; i decide how to sort and classify objects into simple groups with some help.	**Lower KS2 Science National Curriculum** Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. Setting up simple practical enquiries, comparative and fair tests. Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. Children can: a make systematic and careful observations; b observe changes over time; c use a range of equipment, including thermometers and data loggers; d ask their own questions about what they observe; e where appropriate, take accurate measurements using standard units using a range of equipment; f set up and carry out simple comparative and fair tests; g talk about criteria for grouping, sorting and classifying; h group and classify things.	**Upper KS2 Science National Curriculum** 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. Children can: a choose the most appropriate equipment to make measurements and explain how to use it accurately; b take measurements using a range of scientific equipment with increasing accuracy and precision; c make careful and focused observations; d know the importance of taking repeat readings and take repeat readings where appropriate; e independently group, classify and describe living things and materials; f use and develop keys and other information records to identify, classify and describe living things and materials.

	KS1	Lower KS2	Upper KS2
Record	**KS1 Science National Curriculum** Gathering and recording data to help in answering questions. Children can: a record and communicate findings in a range of ways with support; b sort, group, gather and record data in a variety of ways to help in answering questions, such as in simple sorting diagrams, pictograms, tally charts, block diagrams and simple tables.	**Lower KS2 Science National Curriculum** 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. Children can: a collect data from their own observations and measurements; b present data in a variety of ways to help in answering questions; c use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge; d record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables.	**Upper KS2 Science National Curriculum** Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Children can: a decide how to record data from a choice of familiar approaches; b record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs.

	KS1	Lower KS2	Upper KS2

Review	**KS1 Science National Curriculum** Using their observations and ideas to suggest answers to questions. Children can: a notice links between cause and effect with support; b begin to notice patterns and relationships with support; c begin to draw simple conclusions; d identify and discuss differences between their results; e use simple and scientific language; f read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1; g talk about their findings to a variety of audiences in a variety of ways.	**Lower KS2 Science National Curriculum** Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Identifying differences, similarities or changes related to simple scientific ideas and processes. Using straightforward scientific evidence to answer questions or to support their findings. Children can: a draw simple conclusions from their results; b make predictions; c suggest improvements to investigations; d raise further questions which could be investigated; e first talk about, and then go on to write about, what they have found out; f report and present their results and conclusions to others in written and oral forms with increasing confidence; g make links between their own science results and other scientific evidence; h identify similarities, differences, patterns and changes relating to simple scientific ideas and processes; i use straightforward scientific evidence to answer questions or support their findings;	**Upper KS2 Science National Curriculum** Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations. Using test results to make predictions to set up further comparative and fair tests. Identifying scientific evidence that has been used to support or refute ideas or arguments. Children can: a notice patterns; b draw conclusions based in their data and observations; c use their scientific knowledge and understanding to explain their findings; d read, spell and pronounce scientific vocabulary correctly; e identify patterns that might be found in the natural environment; f look for different causal relationships in their data; g discuss the degree of trust they can have in a set of results; h independently report and present their conclusions to others in oral and written forms; i use their test results to identify when further tests and observations may be needed;

		j recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.	j use test results to make predictions for further tests; k use primary and secondary sources evidence to justify ideas; l identify evidence that refutes or supports their ideas; m recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact; n use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas; o talk about how scientific ideas have developed over time.

Working Scientifically – Vocabulary Progression

KS1	Lower KS2	Upper KS2
aim	accurate	accuracy and precision
answers	bar chart	average
block diagrams	chart	bar graphs
changes	classify	causal relationship
classify	comparative test	degree of trust
compare	conclusion (What have we found out?)	dependent variable
data	criteria	digital scales
describe	data	force meter
difference	dependant	independent variable
different	develop	justify
enquiry	diagram	line graphs
equipment	enquiry	pie chart
experience	evaluate	refute
explain	evidence	reliability
explore	explanation	repeat results
findings	key	scatter graphs
gather	hazards	support
group	justify	variables (what do we change, what do we keep the same, how and what are we measuring?)
identify (name)	limitations	
investigate	making a test fair	
measure	method	
notice	observations	
observe	plan (What will we do?)	
patterns	practical enquiry	
pictograms	prediction (What do you think will happen?)	
predict	primary sources	
questions	questioning	

recording research same	reasoning recording relationships	

similarity simple tables sort sorting diagrams table tally charts test What will we do? (plan) What do you think will happen? (prediction) What happened? (results) What have we found out? (conclusion)	report results (What happened?) secondary sources standard units systematic table variable What do we change, what do we keep the same, what are we measuring?	