Comberton Primary School
Science Curriculum Progression

Our Vision

Our role at Comberton is to spark curiosity, creating a world of opportunity, awe and wonder for our children and staff. We aim to equip all our children with the knowledge, skills and values to lead productive, healthy and inspired lives in modern day Britain.

Subject Intent

Our role at Comberton is to spark all children's curiosity as scientists, developing a thirst for learning in finding out why things happen in the way that they do. We will teach methods of enquiry and investigation to stimulate creative thought, scientific knowledge and vocabulary. Through inspiring and relevant lessons, children engage in practical experiences where they develop both the skills required to work as a scientist (disciplinary knowledge) and the scientific knowledge (substantive knowledge) to understand, share ideas and ask scientific questions to answers the many 'wonders' they may have. We want the children to understand the relevance of science to the wider world and their own experiences and begin to appreciate the way in which science will affect the future on a personal, national and global scale.

Our science teaching offers opportunities for children to:

- develop scientific knowledge and conceptual understanding through the specific disciplines of Biology, Chemistry and physics;
- develop the essential scientific enquiry skills to deepen their scientific knowledge;
- use a range of methods to communicate their scientific information and present it in a systematic, scientific manner;
- have a passion for science and its application in past, present and future technologies;
- develop an enthusiasm and enjoyment of scientific learning and discovery;
- have an excitement and passion to pursue science at secondary school and know what career options it could lead to;
- develop the ability to think independently and raise questions.

National Curriculum Overview

EYFS Working Scientifically Skills
Understanding the world involves guiding children to make sense of their physical world and their community. The frequency and range of children's personal experiences increases their knowledge and sense of the world around them – from visiting parks, libraries and museums to meeting important members of society such as police officers, nurses and firefighters. In addition, listening to a broad selection of stories, non-fiction, rhymes and poems will foster their understanding of our culturally, socially, technologically and ecologically diverse world. As well as building important knowledge, this extends their familiarity with words that support understanding across domains. Enriching and widening children's vocabulary will support later reading comprehension.
Show curiosity and ask questions **Make observations using their senses and simple equipment** **Make direct comparisons** **Identify, sort and group** **Record their observations by drawing, taking photographs, using sorting rings or boxes and, in Reception, on simple tick sheets** **Talk about what they have done and found out** **Use their observations to help them to answer their questions**

	Nursery	Reception
Show curiosity and ask questions	Understand 'why' questions, like; "Why do you think the caterpillar got so fat?"	Ask questions to find out more and to check they understand what has been said to them.
Make observations using their sense and simple equipment **Make direct comparisons** **Identify, sort and group**	Use all their senses in hands-on exploration of natural materials. Explore how things work. Use one-handed tools and equipment. Choose the right resources to carry out their own plan. For example, choosing a spade to enlarge a small hole they dug with a trowel. *Make comparisons between objects relating to size, length, weight and capacity.* *Compare quantities using language: 'more than', 'fewer than'.* Select and use activities and resources, with help when needed. This helps them to achieve a goal they have chosen, or one which is suggested to them.	Explore the natural world around them. Describe what they see, hear and feel whilst outside. Develop their small motor skills so that they can use a range of tools competently, safely and confidently. Count objects, actions and sounds. Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen. Show resilience and perseverance in the face of challenge.
Record their observations by drawing, taking photographs, using sorting rings or boxes and, in Reception, on simple tick sheets	Talk about what they see, using a wide vocabulary. Create closed shapes with continuous lines, and begin to use these shapes to represent objects. Draw with increasing complexity and detail, such as representing a face with a circle and including details.	*Connect one idea or action to another using a range of connectives.* *Describe events in some detail.*
Use their observations to help them to answer their questions	*Make comparisons between objects relating to size, length, weight and capacity.* *Compare quantities using language: 'more than', 'fewer than'.*	Listen to and talk about selected non-fiction to develop a deep familiarity with new knowledge and vocabulary. *Connect one idea or action to another using a range of connectives.* *Describe events in some detail.* Compare length, weight and capacity.
Vocabulary	look closely, observe, watch, touch, feel, smell, listen, same, different, compare, ask questions, record, sort, group	

EYFS Progression in Knowledge		
	Nursery	**Reception**
Plants	~ Use all their senses in hands-on exploration of natural materials. ~ Explore collections of materials with similar and/or different properties. ~ Plant seeds and care for growing plants. ~ Understand the key features of the life cycle of a plant and an animal. ~ Begin to understand the need to respect and care for the natural environment and all living things. **Discuss how plants grow and what is essential for them to grow. Children have the opportunity to plant sunflower seed Experiment in Nursery where we plant 2 sunflower seeds and put 1 in the cupboard and 1 on the windowsill and make predictions, observations and justifications of what is happening and why.** **Exploration of different environments on Earth e.g., woodland, jungle, safari, arctic. We discuss what these places look like including animals and plants that grow there and what the weather is like.**	~ Explore the natural world around them. ~ Describe what they see, hear and feel whilst outside. **Discuss how plants grow and explore plants that grow around them through observations in their environment and practical experiences. Children have the opportunity to plant their own bean. Children also grow cress and grass. Learn about how the plants grow in different climates (including deserts and rainforests) and why trees are vital for us to survive on Earth.** **Different climates on Earth (including animals that live there and plants that grow there).** ***Trip to Bodenham Arboretum – forest school site****
Vocab	plant, leaf, stem, branch, root, bark, flower, petal, seed, berry, fruit, vegetable, bulb, plant, hole, dig, water, weed, grow, shoot, die, dead, soil, names of plants they grow	tree, bush, herb, names of plants they see
Living things and their habitats	~ Explore the surrounding natural environment ~ Explore natural objects from the surrounding environment ~ Begin to understand the need to respect and care for the natural environment and all living things. **Exploration of different environments on Earth e.g., woodland, jungle, safari, arctic. We discuss what these places look like and what animals live there and what the weather looks like.**	~ Explore the plants in the surrounding natural environment ~ Explore the animals in the surrounding natural environment. ~ Explore plants and animals in a contrasting natural environment. **Specific life cycles focused on including frogs (intro vocab 'metamorphosis'), butterflies, ladybirds, snails, bees, chickens and ducks - real life experience of duckling eggs in school.** **Different climates on Earth (including animals that live there) are discussed throughout the topic 'It's a big world out there' with the focus on the countries China, Brazil, India, Kenya (Africa), Australia and the Polar Regions. Children compare how these countries differ to our country.** ***Trip to Bodenham Arboretum – forest school site****
Vocab	natural, plant, animal, leaves, seeds, conkers, acorns, twigs, bark, shells, feathers, pebbles, stones, same, different, pattern	plant, tree, bush, flower, vegetable, herb, weed, animal, names of plants and animals they see, name of a contrasting environment (e.g. beach, forest)
Animals, including humans	~ Learn about the life cycles of animals ~Compare adult animals to their babies ~Observe how baby animals change over time ~ Begin to make sense of their own life-story and family's history. ~ Begin to understand the need to respect and care for the natural environment and all living things. ~ Learn about the lifecycles of humans ~Learn about how to take care of themselves ~Learn about their senses. **We discuss the human stages that we go through and identify where each of our family members are at e.g., child, teenager, adult.** **We explore our body and name specific parts by labelling them. We explore the five senses.** • **Smell – smell different items blindfolded**	~ Name and describe animals that live in different habitats. ~Describe different habitats ~Describe people who are familiar to them ~Learn about how to take care of themselves **Children talk about people in their families and can say who lives in their house. They describe differences between people they know. Children learn to name specific parts of their body (eye, ear, nose, mouth, head, neck, shoulders, arm, elbow, head, fingers, chest, stomach, waist, knee, ankle, foot and toe) and look at a skeleton model, along with x-rays, to discuss how the body works. The human body is also explored through work on our five senses.** • **Touch ~ Feely boxes/sorting items by touch.** • **Hearing ~ Make a musical instrument/water xylophone/cup phones/listening walks/how do our ears work**

	• **Touch – feely bags describing how they feel** • **Hearing – listening walks, teaching children to listen activity games, come alive listening games (at the seaside, at the park)** • **Sight – walks – what can we see? What eye colour do we have?** • **Taste – discussion around healthy and unhealthy foods** **Life-cycles of specific animals including frogs, butterflies and chickens.**	• **Sight ~ Eye colour (pictogram)/optical illusion spinning top/binoculars/blindfolds** • **Smell ~ Smell different items/how does our nose work/potions lab/scented items to explore** • **Taste ~ Make and taste fruit kebabs/healthy and unhealthy foods** **Specific life cycles focused on including frogs (intro vocab 'metamorphosis'), butterflies, ladybirds, snails, bees, chickens and ducks - real life experience of duckling eggs in school.** **Different climates on Earth (including animals that live there and plants that grow there) are discussed throughout the topic 'It's a big world out there' with the focus on the countries China, Brazil, India, Kenya (Africa), Australia and the Polar Regions. Children compare how these countries differ to our country.**
Vocab	egg, chick, bird, caterpillar, cocoon, chrysalis, butterfly, frog spawn, tadpole, froglet, frog, grow, change, die, names of animals and their young, fur, feathers, scales, tail, wings, beak, claws, paws, hooves, swim, walk, run, jump, fly, patterns, spots, stripes, grow, change, baby, toddler, child, adult, old person, smell, taste, touch, feel, hear, see, blind, deaf	names of animals, live, on land, in water, jungle, desert, North Pole, South Pole, sea, hot, cold, wet, dry, snow, ice, hair (e.g. black, brown, dark, light, blonde, ginger, grey, white, long, short, straight, curly), eyes (e.g. blue, brown, green, grey), skin (e.g. black, brown, white), big/tall, small/short, bigger/smaller, baby, toddler, child, adult, old person, old, young, brother, sister, mother, father, aunt, uncle, grandmother, grandfather, cousin, friend, family, boy, girl, man, woman
Seasonal changes	**Seasonal observations through listening walks to discuss what we can see at different points in the year (Autumn, Winter, Spring and Summer). Discussion what happens to the leaves on the trees during the seasonal changes. Discussion about what we wear during these seasons and why.**	~ Play and explore outside in all seasons and in different weather ~ Observe living things throughout the year ~ Understand the effect of changing seasons on the natural world around them. **Listening walks to discuss what we can see at different points in the year (Autumn).**
Vocab		spring, summer, autumn, winter, seasons, sunny, cloudy, hot, warm, cold, shower, raining, storm, thunder, lightning, hail, sleet, snow, icy, frost, puddles, windy, rainbow, animals, young, plants, flowers
Materials	~ Explore a range of materials ~ Shape and join materials ~Combine and mix ingredients ~ Change materials by heating and cooling, including cooking **We explore materials and their properties all the time (what does it feel like?) We discuss what materials would be good to use to make a boat and explore this using natural resources in the water tray (floating & sinking)** **We explore in depth during our work on the five senses. We have explored the best materials to use for The Three Little Pigs to build their houses and why. Explore melting and freezing in the water tray with water and ice. Explore what happens to sand when we add water to it.**	~ Explore a range of materials, including natural materials ~Make objects from different materials, incuding natural materials ~ Observe, measure and record how materials change when heated and cooled ~Compare how materials change over time and in different conditions **Materials and their properties are explored through work on our five senses, specifically sense of touch (feely boxes/sorting items by touch) and sight (transparent materials and what is best where and for what purpose). Children make a boat for the Gingerbread Man based on properties of water and also explore materials used for building houses (The Three Little Pigs). Children test out cars on different surfaces to see which materials slowed the cars down, making predictions and then explaining what happened and why.** **Different houses, buildings and shelters compared in 'It's a big world out there' with the focus on the countries China, Brazil, India, Kenya (Africa), Australia and the Polar Regions. Children compare how these countries differ to our country – where do people live and why?**
Vocab	mix, stir, cook, hot, oven, microwave, change, burn, melt, hard, runny, set, freeze, freezer, cold, blended, hard, soft, bendy, stiff, wobbly, wood, plastic, paper, card, fabric	ice, water, frozen, icicle, snow, melt, wet, cold, slippery, smooth, big, bigger, biggest, smaller, smaller, smallest, hard, soft, bendy, rigid, wood, plastic, paper, card, metal, strong, weak, hot, apply heat, waterproof, soggy, not waterproof, best, change, change back
Light	~ Explore light sources. ~ Shine light on or through different materials	~ Explore shadows ~Explore rainbows.

		Children learn about the importance of light for us to survive and plants to grow. They talk about reflective materials (Linked to 'Hansel and Gretel') and why these keep us safe when it is dark.
Vocab	light, torch, bulb, lamp, spotlight, shiny, bright, brighter, brightest, Sun, shine, glow, mirror	Sun, sunny, light, shadow, shady, clouds, torch, see-through, not see-through, source, light source
Forces	~ Explore how things work. ~ Explore and talk about different forces they feel. ~ Explore how objects/materials are affected by forces. **Children explore a range of objects and toys in Nursery which require them to investigate how they move. Explore heavy and light and how this impacts floating and sinking.**	~ Explore how to change how things work ~Explore how the wind can move objects ~Explore how objects move in water. **Children explore push and pull forces through testing cars out on different ramps and using push and pull cars. They learn about gravity and how vehicles move including cars, trains, boats, rockets, aeroplanes and hot air balloons.**
Vocab	object, float, sink, water, up, down, top, bottom, push, pull, magnet, spring, squash, bend, twist, stretch, turn, spin, smooth, rough, fast, slow	float, sink, up, down, top, bottom, surface, move, roll, drop, fly, turn, spin, fall, fast, slow, faster, slower, fastest, slowest, further, furthest, wind, air, water, blow, bounce
Sound	~ Listen to sounds ~ Make sounds. **Explore sound through the five senses. Access to musical instruments all year and exploring being quiet and being loud. When exploring outside and on our listening walks, focusing on what we can hear.**	~ Listen to sounds outside and identify the source. ~Make sounds. **Sound is explored through work on our five senses, specifically sense of hearing by making a musical instrument, exploring water xylophones, making cup phones, going on a listening walks and how our ears work.**
Vocab	sound, noise, loud, quiet, high, low, music, bang, blow, pluck, soft, hard, fast, slow, names of instruments	sound, noise, listen, hear, music, voices, bird song, traffic, sirens, thunder, high, low, loud, quiet, soft, volume, crackle, thunder, hum, buzz, roar
Electricity	~ Identify electrical devices ~Use battery powered devices.	
Vocab	battery, plug, socket, electricity, wire, sound, light, move	
Earth and Space		~ Learn about the Earth, sun, Moon, planets and stars ~Learn about space travel **Children read a range of stories about space and learn about the moon landings. They look at how rockets fly and learn about the planets in the solar system, along with the force of gravity on Earth and how the moon affects parts of our world. They talk about what they know about space and discuss night and day, exploring light and dark.** **Different climates on Earth are discussed throughout the topic 'It's a big world out there' (Summer 1) including how humans survive on Earth and why rainforests are so important and how climate change is affecting our planet.**
Vocab		Sun, Moon, Earth, star, planet, sky, day, night, space, round, bounce, float
Key Vocabulary		
Experiment, test, fair, why, senses (touch, sight, hearing, taste and smell), world, plants, leaf, stem, root, flower, animals, human, materials (and associated properties), waterproof, natural, change, growth, decay, environment, force, push, pull, gravity, float, sink, light, dark.		

KS1 and KS2 Unit Overview

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Progression of Knowledge and Skills – National Curriculum Expectations

Working Scientifically

Concept/Area of Study	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Plan	Ask simple questions when prompted. Suggest ways of answering a question	Ask simple questions Recognise that questions can be answered in different ways	Ask relevant questions when prompted. Use different types of scientific enquiry to answer them. Set up simple and practical enquiries, comparative and fair tests with some support.	Ask relevant questions. Use different types of scientific enquiries to answer their questions Set up simple and practical enquiries, comparative and fair tests	Plan different types of scientific enquiries to answer questions. With prompting, recognise and control variables where necessary.	Plan different types of scientific enquiries to answer questions. Recognise and control variables where necessary.
Do	Make relevant observations using simple equipment Conduct simple tests, with support. Identify and classify with guidance	Observe closely, using simple equipment. Perform simple tests. Identify and classify.	Make systematic and careful observations, using simple equipment. Use standard units when taking measurements.	Make systematic and careful observations using a range of equipment, including thermometers and data loggers. Take accurate measurements using standard units, where appropriate.	Select, with prompting, and use appropriate equipment to take readings. Take precise measurements using standard units. Begin to understand the need for repeat readings.	Use a range of scientific equipment to take measurements. Take measurements with increasing accuracy and precision. Take repeat readings when appropriate.
Record	Gather and record data	Record and communicate their findings in a range of ways and begin to use simple scientific language. Gather and record data to help answer questions.	With modelling and guidance, gather, record, classify and present data in a variety of ways to help to answer questions. With prompting, use various ways of recording, grouping and displaying evidence and suggest how findings may be tabulated.	Gather, record, classify and present data in a variety of ways to help to answer questions. Record findings using simple scientific language, drawings and labelled diagrams. Record findings using keys, bar charts, and tables.	Take and process repeat readings. Record data and results. Record data using labelled diagrams, keys, tables and charts. Use line graphs to record data.	Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar charts and line graphs.
Review	Recognise findings. Use their observations and ideas to suggest answers to simple questions.	Use their observations and ideas to suggest answers to simple questions.	With prompting, suggest conclusions from enquiries. Suggest how findings could be reported.	Report on findings from enquiries, including oral and written explanations, of results and conclusions.	Report and present findings from enquiries, including conclusions and, with prompting, suggest causal relationships.	Report and present findings from enquiries, including conclusions and causal relationships.
Essential vocabulary –	Questions, answers, equipment, gather, measure, record, results sort, group, test, explore, observe, compare, describe, similar/ities, different/ces, beaker, pipette, syringe.	Previous vocab plus observe changes over time, notice patterns, secondary sources, hand lenses, egg timers, identify, classify, data	Previous vocab plus scientific enquiry changes over time, notice patterns, secondary sources, comparative tests, fair tests, careful, accurate, observations, equipment, gather, measure, record, data, evidence, results, keys, bar charts, table, results, conclusions, predictions, support, thermometers	Previous vocab plus enquiry types increase, decrease, identify, classify, order, notice patterns, relationships, appearance, present results, data loggers	Previous vocab plus, notice, patterns, relationships, independent variable, dependent variable, controlled variable, accuracy, precision, degree of trust, classification keys, scatter graphs, line graphs, causal relationships, support/refute, data loggers	Previous vocab plus opinion/fact, confidently name scientific enquiry types

Biology

Areas of Study	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Animals including Humans (Biology)	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.	Understand that animals, including humans, have offspring, which grow into adults. 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.	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.	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.	Describe the changes as humans develop to old age.	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. - (see also Evolution and inheritance)
Vocabulary	head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves, names of animals experienced first-hand from each vertebrate group, senses, touch, see, smell, taste, hear, fingers, skin, eyes, nose, ears, tongue	offspring, reproduction, growth, baby, toddler, child, teenager, adult, old person, names of animals and their babies (e.g. chick/chicken, kitten/cat, caterpillar/butterfly), survive, survival, water, food, air, exercise, heartbeat, breathing, hygiene, germs, disease, food types (e.g. meat, fish, vegetables, bread, rice, pasta, dairy)	nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, joints, support, protect, move, skull, ribs, spine	digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, large intestine, rectum, anus, incisor, canine, molar, premolar, herbivore, carnivore, omnivore, producer, predator, prey	Growth, development, stages, embryo, foetus, uterus, womb, vagina, ovaries, gestation period, life cycle, adolescent, puberty, penis, menstruation, periods, hormones, testicles, pubic hair, mental health	heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, cycle, circulatory system, diet, drugs, lifestyle

Living things and their Habitats (Biology)		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 micro- habitats. 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.		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.	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.	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. - (see also Evolution and inheritance).
Vocabulary		living, dead, never been alive, suitable, basic needs, food chain, shelter, move, feed, water, air, survive, names of local habitats (e.g. pond, woodland etc.), names of micro-habitats (e.g. under logs, in bushes etc.), conditions, light, dark, shady, sunny, wet, damp, dry, hot, cold, names of living things in the habitats and micro-habitats studied		Classification, habitat, environment, human impact, amphibians, reptiles, birds,mammals, vertebrates,invertebrates	Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, cuttings	vertebrates, fish, amphibians, reptiles, birds, mammals, warm-blooded, cold-blooded, invertebrates, insects, spiders, snails, worms, flowering, non-flowering, mosses, ferns, conifers

Plants (Biology)	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.	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.	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 lifecycle of flowering plants, including pollination, seed formation and seed dispersal.			(see Evolution and inheritance)
Vocabulary	leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud, names of trees in the local area, names of garden and wild flowering plants in the local area	light, shade, Sun, warm, cool, water, space, grow, healthy, bulb, germinate, shoot, seedling	photosynthesis, pollen, insect/wind pollination, male, female, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersal), air, nutrients, minerals, soil, absorb, transport			
Evolution and Inheritance (Biology) ***(note for Year 6 – see Plants; Animals, including humans; Living things and their habitats; and Rocks***						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

for how some of these aspects have been covered lower down the school)						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						Offspring, sexual reproduction, vary, adapted, evolution, evolve, characteristics, species

Chemistry

Everyday materials (Y1) ***Uses of Everyday materials (Y2)*** ***States of matter (Y4)*** ***Properties and changes of materials (Y5)***	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 every day materials. Compare and group together a variety of every day materials	Identify and compare thesuitability of a variety ofeveryday materials, includingwood, metal, plastic, glass, brick,rock, paper and cardboard forparticular uses find out how theshapes of solid objects madefrom some materials can bechanged by squashing, bending,twisting and stretching.		Compare and group materials together, according to whetherthey 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	Compare and group together everyday materials onthe 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	

	on the basis of their simple physical properties.			the water cycle and associate the rate of evaporation with temperature.	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	Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, waterproof, absorbent, tear, rough, smooth, shiny, dull, see through, not see through	opaque, transparent, translucent, reflective, non-reflective, flexible, rigid, shape, push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching		solid, liquid, gas, heating, cooling, state change, melting, freezing, melting point, boiling, boiling point, evaporation, condensation, temperature, water cycle	thermal insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, rusting, new material	

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.			(see Evolution and inheritance)
Vocabulary			rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorbs water, fossil, bone, flesh, minerals, marble, chalk, granite, sandstone, slate, types of soil (e.g. peaty, sandy, chalky, clay)			

Physics

Seasonal changes	Observe changes across the four seasons - observe and describe weather associated with the seasons and how day length varies.					

Vocabulary	weather, sunny, rainy, raining, shower, windy, snowy, cloudy, hot, warm, cold, storm, thunder, lightning, hail, sleet, snow, icy, frost, puddles, rainbow, seasons, winter, summer, spring, autumn, Sun, sunrise, sunset, day length					
Light (Y3 and Y6) ***Sound (Y4)***			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 a solid object. Find patterns in the way that the size of shadows change.	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.		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.
Vocabulary			light, light source, dark, absence of light, surface, shadow, reflect, mirror, Sun, sunlight, dangerous	sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, quiet, loud, insulation		Light rays, light source, reflect, light rays, shadow, block, absorb, direction, transparent, opaque, translucent

Forces and magnets (Y3) ***Forces (Y5)***			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.		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			force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole		force, gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears	

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.		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.
Vocabulary				electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol		(Year 4 vocab plus)circuit diagram, circuit symbol, voltage

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.	
Vocabulary					Sun, Moon, Earth, planets (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune), spherical, Solar System, rotate, star, orbit	

At the End of the EYFS
ELG – The Natural World Children at the expected level of development 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.

At the End of Year One			
Working Scientifically	**Biology**	**Chemistry**	**Physics**
Ask simple questions and recognise that they can be answered in different ways. Make relevant observations using simple equipment. Conduct simple tests, with support. Identify and classify with guidance Gather and record data Recognise findings. Use their observations and ideas to suggest answers to simple questions.	**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. **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.	**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 every day materials. Compare and group together a variety of every day materials on the basis of their simple physical properties.	**Seasonal changes** Observe changes across the four seasons - observe and describe weather associated with the seasons and how day length varies.
Essential Vocabulary: questions, answers, equipment, gather, measure, record, results sort, group, test, explore, observe, compare, describe, similar/ities, different/ces, beaker, pipette, syringe.	leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud, names of trees in the local area, names of garden and wild flowering plants in the local area head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves, names of animals experienced first-hand from each vertebrate group, senses, touch, see, smell, taste, hear, fingers, skin, eyes, nose, ears, tongue	Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, waterproof, absorbent, tear, rough, smooth, shiny, dull, see through, not see through	weather, sunny, rainy, shower, windy, snowy, cloudy, hot, warm, cold, storm, thunder, lightning, hail, sleet, snow, icy, frost, puddles, rainbow, seasons, winter, summer, spring, autumn, Sun, sunrise, sunset, day length

At the End of Year Two			
Working Scientifically	**Biology**	**Chemistry**	**Physics**
Ask simple questions Recognise that questions can be answered in different ways. Observe closely, using simple equipment. Perform simple tests. Identify and classify. Record and communicate their findings in a range of ways and begin to use simple scientific language. Gather and record data to help answer questions. Use their observations and ideas to suggest answers to simple questions.	**Animals including humans** Understand that animals, including humans, have offspring, which grow into adults. 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. **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 micro-habitats. 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. **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.	**Uses of everyday materials** Identify and compare the suitability of a variety ofeveryday materials, includingwood, metal, plastic, glass, brick,rock, paper and cardboard forparticular uses find out how theshapes of solid objects madefrom some materials can bechanged by squashing, bending,twisting and stretching.	
Essential Vocabulary: observe changes over time, patterns, hand lenses, egg timers, identify, classify, data	offspring, reproduction, growth, baby, toddler, child, teenager, adult, old person, names of animals and their babies (e.g. chick/chicken, kitten/cat, caterpillar/butterfly), survive, survival, water, food, air, exercise, heartbeat, breathing, hygiene, germs, disease, food types (e.g. meat, fish, vegetables, bread, rice, pasta, dairy) living, dead, never been alive, suitable, basic needs, food chain, shelter, move, feed, water, air, survive, names of local habitats (e.g. pond, woodland etc.),	opaque, transparent, translucent, reflective, non-reflective, flexible, rigid, shape, push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching	

	names of micro-habitats (e.g. under logs, in bushes etc.), conditions, light, dark, shady, sunny, wet, damp, dry, hot, cold, names of living things in the habitats and micro-habitats studied light, shade, Sun, warm, cool, water, space, grow, healthy, bulb, germinate, shoot, seedling		

At the End of Year Three			
Working Scientifically	**Biology**	**Chemistry**	**Physics**
Ask relevant questions and using different types of scientific enquiries to answer them. Set up simple practical enquiries, comparative and fair tests. Make 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.	**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. **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.	**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.	**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. **Forces** 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.
Essential Vocabulary: scientific enquiry changes over time, notice patterns, secondary sources, comparative tests, fair tests, careful, accurate, observations, equipment,	photosynthesis, pollen, insect/wind pollination, male, female, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersal), air, nutrients, minerals, soil, absorb, transport	rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorbs water, fossil, bone, flesh, minerals, marble, chalk, granite, sandstone, slate, types of soil (e.g. peaty, sandy, chalky, clay)	light, light source, dark, absence of light, surface, shadow, reflect, mirror, Sun, sunlight, dangerous force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar

gather, measure, record, data, evidence, results, keys, bar charts, table, results, conclusions, predictions, thermometers	nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, joints, support, protect, move, skull, ribs, spine		magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole

At the End of Year Four			
Working Scientifically	**Biology**	**Chemistry**	**Physics**
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.	**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. **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.	**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.	**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. **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.
Essential Vocabulary: enquiry types increase, decrease, identify, classify, order, notice patterns, relationships, appearance, present results, data loggers	Classification, habitat, environment, human impact, amphibians, reptiles, birds,mammals, vertebrates,invertebrates digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, large intestine, rectum, anus, incisor, canine, molar, premolar, herbivore, carnivore, omnivore, producer, predator, prey	solid, liquid, gas, heating, cooling, state change, melting, freezing, melting point, boiling, boiling point, evaporation, condensation, temperature, water cycle	electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, quiet, loud, insulation

At the End of Year Five			
Working Scientifically	**Biology**	**Chemistry**	**Physics**
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.	**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. **Animals including humans** Describe the changes as humans develop to old age.	**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.	**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. **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.
Essential Vocabulary: notice, patterns, relationships, independent variable, dependent variable, controlled variable, accuracy, precision, degree of trust, classification keys, scatter graphs, line graphs, causal relationships, support/refute, data loggers	Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, cuttings Growth, development, stages, embryo, foetus, uterus, womb, vagina, ovaries, gestation period, life cycle, adolescent, puberty, penis, menstruation, periods, hormones, testicles, pubic hair, mental health	thermal insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, rusting, new material	Sun, Moon, Earth, planets (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune), spherical, Solar System, rotate, star, orbit force, gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears

At the End of Year Six			
Working Scientifically	**Biology**	**Chemistry**	**Physics**
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.	**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 micro-organisms, plants and animals. Give reasons for classifying plants and animals based on specific characteristics. **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. **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.		**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. **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.
Essential Vocabulary: opinion/fact, confidently name scientific enquiry types	vertebrates, fish, amphibians, reptiles, birds, mammals, warm-blooded, cold-blooded, invertebrates, insects, spiders, snails, worms, flowering, non-flowering, mosses, ferns, conifers heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, cycle, circulatory system, diet, drugs, lifestyle Offspring, sexual reproduction, vary, adapted, evolution, evolve, characteristics, species		Light rays, light source, reflect, light rays, shadow, block, absorb, direction, transparent, opaque, translucent (Year 4 vocab plus)circuit diagram, circuit symbol, voltage