



All Saints CE Primary School & Nursery
Subject: SCIENCE (Revised 2022)

Subject Overview

HOW DOES THIS SUBJECT FIT IN?

EYFS Framework: Understanding the World

KS1 National Curriculum

KS2 National Curriculum

Aims of Science (from National Curriculum):

- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them, including the use of common vocabulary and scientific terminology
- are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.
- Progression of both Substantive Science Knowledge and Disciplinary Knowledge will follow through each Key Stage and build on previous learning. Enquiry based learning will be scaffolded and practical work will have a clear curriculum goal. The aim will be for teacher explanation and demonstration (where possible) with whole-class discussion prior to enquiry based activities to provide a sound framework for exploration, make connections with prior learning and minimise misconceptions.

What this looks like in EYFS:

Science at Foundation Stage (Nursery & Reception) is covered in the 'Understanding the World' and PSED area of the EYFS Framework. It is introduced indirectly through activities that encourage children to explore, problem solve, observe, predict, think, make decisions and talk about the world around them. Early Years Science learning also helps children in other areas of the EYFS Framework, such as Physical Development and Expressive Arts & Design. They will observe and manipulate. They will learn to use their senses to feel objects and listen to sounds in the environment. They will make observations of animals & plants and explain why some things occur and talk about changes. The children are encouraged to ask questions about why things happen and how things work, and what they think will happen. They will be introduced to simple scientific vocabulary through discussion rhymes, songs and stories

What this looks like in KS1:

- The principal focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly-constructed world around them. They should be encouraged to be curious and ask questions about what they notice.
- They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. They should begin to use simple scientific language and build on vocabulary attained in EYFS to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.
- Pupils should read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

What this looks like in Lower KS2:

- The principal focus of science teaching in lower key stage 2 is to enable pupils to broaden their scientific view of the world around them. They should do this through structured exploration, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions.

- They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information.
- Pupils should learn how to record their findings in simple tables, graphs etc (linked to their learning in Maths)
- They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.
- Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.

What this looks like in Upper KS2:

- The principal focus of science teaching in upper key stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through structured exploration and discussion of their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically.
- At upper key stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information.
- Pupils should learn to record their findings in more complex graphical and tabular formats (linked to their learning in Maths), showing some understanding of which format best communicates the data
- Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.
- Pupils should read, spell and pronounce scientific vocabulary correctly.

Overview of units taught (EYFS Understanding the World & PSED curriculum):

Programmes of Study	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Plants	Plants	In the Garden	Growing Plants	Investigating Plants			
Animals including Humans	Bodies (PSED – Growing and Changing)	At the Zoo	Growth & Survival	The Human Body	Teeth & Digestion	Life Cycles	Humans & Health
Living Things & Their Habitats	Habitats & Bugs (UTW- Pond-dipping, identifying animals. Minibeasts & Lifecycles)	Seasonal Changes	Living things and their Habitats		Classification & Extinction	Life Cycles & Reproduction	Classification & Micro-organisms
Materials	Objects & Potions (UTW- Cooking and concocting)	Everyday Materials	Uses of Everyday Materials	Rocks, Fossils & Soils	States of Matter	Properties & Changes	
Light & Sound	Senses (PSED – Life Skills)			Light & Shadows	Sound		How Light Travels

Forces	Moving			Forces & Magnetism		Forces	
Electricity	Batteries				Circuits and Components		Circuits
Space						Earth & Space	
Evolution & Inheritance							Adaptation, Evolution & Inheritance

Progression in Substantive Scientific Knowledge

Bold statements are direct expectations from the National Curriculum. Others are from 'non-statutory' guidance, and those in italics are opportunities to stretch learners further.

Plants

	Expectations	Key words
EYFS Plants	<ul style="list-style-type: none"> identify something as a plant name some common plants, identify leaf, root, stem and flower recognise that plants need water to grow name some places plants live identify the seeds in a fruit 	Root, stem, tree, leaf, flower, water, seed, plant,
Y1 In the Garden	<ul style="list-style-type: none"> make observations of plants, including flowers and vegetables they have planted identify the leaf, root, stem and flower of a plant identify the trunk, branch, roots and leaves of a tree know that plants produce seeds identify differences between plants identify and describe the basic structure of a variety of common flowering plants, including trees name some common plants name some plants that live in the garden name some plants that live in the wild name some trees in the local environment recognise that different plants live in the local environment 	petal, tall, taller, tallest, wild, trunk, similar, different, within, under, next to, soil, blossom, fruit, leaves, branch, bulbs, shrub, alive, vegetables, grass, garden, habitat, deciduous, earth, evergreen, compost, non-living, living, not alive, dead, artificial Names e.g. daffodil, daisy, sunflower, rose, lavender, tulip,

	<ul style="list-style-type: none"> • use simple identification guides to name plants in the local environment • identify and name a variety of common wild and garden plants, including deciduous and evergreen trees • <i>compare and contrast different plants</i> • <i>sequence pictures of how plants changes over time</i> • <i>describe how deciduous trees changes throughout the year</i> • <i>explain why some plants are only seen at certain times of the year</i> • <i>Label pictures / Simple tables</i> 	snowdrop, holly, dandelion, oak, beech, chestnut, pine
Y2 Growing Plants	<ul style="list-style-type: none"> • know that flowering plants produce seeds which grow into new plants • know that some plants have bulbs from which they grow • make observations of plants over time • explore how plants from seeds and bulbs grow • describe what happens to bulbs during the plant cycle as they grow • describe what happens to a seed as it grows and develops • describe what they observe as new plants grow • observe and describe how seeds and bulbs grow into mature plants • <i>compare the plant cycle for a plant from a seed with that from a bulb</i> • suggest how to find out about what plants need in order to grow well • recognise that plants are living and need water, light and warmth to grow • describe differences between plants grown in the light and in the dark • find out and describe how plants need water, light and a suitable temperature to grow and stay healthy • <i>explain how to look after a variety of plants</i> • <i>know that a seed and bulb both contain everything a plant needs to grow</i> • <i>explain that seeds and bulbs do not need light to germinate and identify how this is different to the needs of a plant</i> • <i>explain how plants in the desert survive with little water and plants in the rainforest survive with little light</i> 	seedling, bulb, buds, shoot, water, sun light, seeds, nuts, fruit stones, warm, grow, temperature
Y3 Investigating Plants	<ul style="list-style-type: none"> • identify parts of flowering plants • identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers • describe why healthy roots and a healthy stem are needed for plants to grow • recognise that the leaves of a plant are associated with healthy growth and more specifically nutrition • recognise that plants need light, water and warmth and healthy leaves, roots and stems in order to grow well 	Ground, transport, attract bees, catch sunshine, green, air, nutrients, growth, pollen, pollination, seed formation, seed dispersal, carpel, stamen, anther, style, nutrition, support, anchor, reproduction

	<ul style="list-style-type: none"> • know that water travels from the roots up the stem • 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 • know that plants make their own food • know that fertilisers contain minerals • understand that plants absorb minerals from the soil (Teacher Note: plants create their own food using sunlight, water and carbon dioxide, they do not absorb food from the soil) • describe how changes to light and fertiliser affect plant growth • <i>explain that differences in plant growth are due to the amount of light and/or water</i> • investigate the way in which water is transported within plants • describe how the stem has a role in support and nutrition (transport of water) • <i>explain why healthy roots and a healthy stem are needed for plants to grow</i> • explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal • describe why plants need flowers • sequence pictures to show the life cycle of a plant • describe how pollen and seeds are dispersed • explain the role of bees and insects in pollination • <i>describe the processes of pollination, seed formation and seed dispersal</i> • <i>compare the roots of different plants (e.g. desert plants or rainforest trees)</i> (Teacher Note: rainforest trees have very shallow roots as the quality of the soil is more and most of the nutrients are near the surface) 	
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Animals, including humans

	Expectations	Key words
EYFS Bodies	<ul style="list-style-type: none"> • identify something as an animal • name some places animals live • identify and locate parts of their body • identify and locate parts of animals bodies • use their observations to describe humans and other animals • name a very limited range of food • can identify types of exercise • name baby, child, adult and the young of some other animals 	Animal, head, legs, arms, knee, elbow, neck, face, feet, hands, bread, potatoes, apples, cereals, rice, meat, fish, milk, running, jumping, swimming, walking, chicken, hen, kitten, cat, puppy, dog, duckling, duck
Y1 At the Zoo	<ul style="list-style-type: none"> • identify and name a selection of animals • identify and sort animals into different groups 	Body parts: eyes, ears, elbows, hair, mouth, nose, teeth, paw,

	<ul style="list-style-type: none"> • name the different groups of animals • identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals • make observations of animals • know that animals eat different types of food • identify the food of some common animals • recall and use the words: carnivore, herbivore and omnivore • identify and name a variety of common animals that are carnivores, herbivores and omnivores • <i>group animals that belong to: carnivores, herbivores and omnivores</i> • use their observations to point out differences between humans and other animals and between animals and non-living things • describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) • identify and locate the sense organs • use senses to describe textures, sounds and smells • compare differences in texture, sounds and smells • name and locate the basic parts of the human body • draw and label a simple body outline • <i>describe differences between the different animal groups (e.g. birds have feathers but mammals have fur)</i> • <i>identify animals which are more likely to be seen in different seasons</i> • <i>explain why some animals are only seen at night</i> 	<p>hoof, tail, fin, shell, skin, wings, beak, fir, scales, feathers Fish: goldfish, tuna, salmon Birds: blackbird, magpie, robin, sparrow, crow, swan. Reptiles: snake, lizard, tortoise Mammals: mouse, horse, cow, sheep, hamster, rabbit Amphibians: frog, toad, newt Senses: feel, hear, smell, see, taste, touch Carnivore, omnivore, herbivore</p>
<p>Y2 Growth and Survival</p>	<ul style="list-style-type: none"> • recognise that animals produce young • notice that animals, including humans, have offspring which grow into adults • recognise changes that take place as animals get older • explain that adult animals no longer grow • describe some differences they observe between babies and toddler • make comparisons of the differences they observe between babies and toddlers • identify the offspring of a selection of different animals • <i>use evidence to show that adult animals no longer grow</i> • <i>use evidence to show that children of the same age are not all the same size</i> • <i>use evidence to show that older children are generally taller than younger children</i> • find out about and describe the basic needs of animals, including humans, for survival (water, food and air) • <i>explain how to look after a pet describing what it needs to survive</i> • describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene • recognise that exercise is important 	<p>Baby, toddler, adult, eggs, fruit, vegetables, water, fibre, meat, fish, cheese, beans washing, exercise, diet offspring</p>

	<ul style="list-style-type: none"> • name some types of food • identify some types of food that make up their diet and name some examples of each • recognise that an adequate diet and exercise are necessary for them to grow and stay healthy • describe some of the types of food that they eat 	
Y3 The Human Body	<ul style="list-style-type: none"> • identify some foods needed for a healthy and varied diet • name the components of a healthy and varied diet • describe how their diet is balanced • 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 • <i>describe the role of different food groups</i> • <i>compare and contrast diets of animals including pets</i> • <i>describe an adequate and varied diet for humans, recognising that there are many ways of achieving this</i> • know they have bones and muscles in their body • state that they and other animals have skeletons • identify animals that do not have an internal skeleton (invertebrates) • group animals with and without an internal skeleton • <i>describe some advantages of having an internal skeleton over no skeleton or an exoskeleton</i> • describe some observable characteristics of bones • describe the main functions of their skeletons • state that movement depends on both skeleton and muscles • state that when one muscle contracts another relaxes • identify that humans and some other animals have skeletons and muscles for support, protection and movement • recognise that their skeletons grow as they grow • <i>describe problems associated with broken bones or bones diseases</i> 	Balanced diet, carbohydrates, protein, fats, fibre, fruit and vegetables, bones, muscles, femur, ribs, spine, tibia, shoulder blade, hollow, relax and contract, protect, support, internal skeleton, exoskeleton
Y4 Teeth and Digestion	<ul style="list-style-type: none"> • identify a wider range of body parts, including some internal organs (large intestine, small intestine, brain, lungs, heart, stomach, oesophagus) • locate and name the different organs in the digestive system • describe the role of each organ in the digestive system • describe the simple functions of the basic parts of the digestive system in humans • <i>explain why food needs to be broken down</i> • recognise they need to take care of their teeth • name the different types of teeth • describe the role of each type of teeth in digestion • identify the different types of teeth in humans and their simple functions • explain how they should look after their teeth and recognise why they need to do so 	Teeth and eating: incisor, molar, canine, diet, decay, healthy, teeth, acids, sugars, mouth, rip, tear, chew, grind Digestive system: saliva tongue, toilet waste, nutrients energy, stomach, large/small intestine, brain, lungs, movement, acids, urine, faeces, oesophagus

	<ul style="list-style-type: none"> • <i>explain why dentists are concerned about the amount of sugar children have</i> • state that animals have different diets and may have different kinds of teeth • <i>explain how fossilised teeth give us clues about an animals' diet</i> • <i>explain why the teeth of certain types of animals need to be different</i> • <i>explain why humans do not have a full set of adult teeth at birth</i> 	
Y5 Life Cycles (This could be taught with living things and their habitats)	<ul style="list-style-type: none"> • describe the changes as humans develop to old age • identify ways in which the appearance of humans changes as they get older • identify some characteristics that will not change with age • recognise stages in growth and development of humans including puberty 	New born, infant, child, teenager, puberty, adult, wrinkles, grey hair, height, weight,
Y6 Humans and Health	<ul style="list-style-type: none"> • identify and name the parts of the circulatory system • know that the heart is made of muscle • describe what the heart and blood vessels do • identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood • state how to measure pulse rate • recognise that pulse rate is a measure of how fast the heart is beating • discover that during exercise the heart beats faster to take blood more rapidly to the muscles • make careful measurements of pulse rate • describe the different functions of the blood (e.g. transporting and protecting) • know that the blood comes from the heart in arteries and returns to the heart in veins • know that blood carries oxygen and other essential materials around the body • <i>explain how ideas about the circulatory system have changed over time</i> • identify some of the harmful effects of smoking • 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 • recognise that care needs to be taken with medicines and that they can be dangerous • give several reasons why it is sometimes necessary to take medicines • identify some harmful effects of drugs • identify food as a fuel for the body • name the major groups into which food is categorised and identify sources for each group • describe the main function of organs of the human body • <i>explain the effect of diet on particular organs of the body / aspects of health</i> • <i>explain the effect of exercise on particular organs of the body/aspects of health</i> 	Heart, veins, arteries, capillaries, blood, pulse, beats, oxygen, carbon dioxide nutrients, organs, drugs, medicines, minerals, vitamins, lungs, caffeine, medical, legal, illegal

	<ul style="list-style-type: none"> • explain how ideas about smoking have changed over time • explain why advice on diet changes (e.g. butter vs margarine, five a day, tax on sugary drinks) 	
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Living things and their habitats

	Expectations	Key words
EYFS	See 'Animals including humans' <i>Understanding the World – Mini beasts, Lifecycles, Pond Dipping</i>	
Y1 Seasonal changes	<ul style="list-style-type: none"> • observe changes across the four seasons • identify what to observe • use descriptive words, photos and pictures to record changes • collect evidence of changes (e.g. leaves, seeds, flowers) • name the four seasons • recall simple changes associated with each season • observe and name types of weather (e.g. rain, sun, wind, clouds) • observe and describe weather associated with the seasons and how day length varies • identify what to measure about the weather • use prepared tables and charts to record data • <i>use secondary data to describe weather in another setting</i> • <i>explain why animals are easier to spot at different times of year (e.g. migrating birds, hibernating animals)</i> 	Seasons: Autumn, Spring, Summer, Winter, deciduous, evergreen, shoot, fruit, earth, seeds, leaves, flowers, weather types: rain, hail, snow, ice, frost, sun, showers, wind, reproduce, babies/adults, life cycles, birds, insects, cold, warm, hot, sunrise, sunset
Y2 Habitats	<ul style="list-style-type: none"> • with help, use keys to identify some animals and plants • recognise that different plants live in the local environment • identify some local habitats • describe the simple features of habitats • recognise a microhabitat as a small habitat (e.g. leaf litter, woodlice under stones) • describe some microhabitats • identify and name a variety of plants and animals in their habitats, including micro- habitats • recognise similarities and differences between plants and animals • explore and compare the differences between things that are living, dead, and things that have never been alive • explain differences between living and non-living things in terms of characteristics such as movement and growth • use their observations to point out differences between animals, plants and non-living things • recognise that plants provide food for humans and other animals within an environment • construct a simple food chain (e.g. grass, cow, human) 	Dead, alive, living, non-living, habitats, keys, breathe, grow, eat, have babies, move, sense, go to the toilet, habitat, microhabitat, food chain

	<ul style="list-style-type: none"> • 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 • name a few of the organisms that live in a particular habitat • suggest reasons why different plants and animals are found in the different environments • 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 • <i>compare animals found in familiar habitats with unfamiliar habitats</i> • <i>compare plants found in familiar habitats with unfamiliar habitats</i> • <i>use different factors to compare a range of habitats (e.g. water, light, temperature)</i> 	
<p>Y4 Classification and Extinction (This includes food chains statement from animals including humans.)</p>	<ul style="list-style-type: none"> • explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment • recognise that living things can be grouped in a variety of ways • explore ways of grouping living things including animals and plants (flowering and non-flowering) • recognise that animals can be grouped into vertebrates and invertebrates • describe some of the characteristics of the vertebrate (fish, mammals, amphibians, reptiles and birds) groups (e.g. warm-blooded, have fur, lay eggs) • group animals into vertebrate (fish, mammals, amphibians, reptiles and birds) and invertebrates groups (snails, slugs, spiders, worms and insects) • <i>explain why some animals are hard to classify (e.g. platypus, echidna, bat, flightless birds)</i> • identify that some animals feed on other animals and some on plants • represent feeding relationships with simple food chains • recognise that a food chain must always start with a green plant (a producer) • represent feeding relationships within a habitat with food chains beginning with a green plant which ‘produces’ food for the other organisms • recognise that green plants are the ultimate source of food for all animals • use and understand the terms: producer, predator and prey • construct and interpret a variety of food chains, identifying producers, predators and prey (Teacher Note: statement moved from NC ‘Animals including humans’ to improve progression within topics) • <i>use food chains to predict what might happen to the numbers of an organism if there are suddenly more predators or less prey</i> • know the function of some of the more complex features which aid survival in specific habitats (e.g. gills, blubber, camouflage) • describe why different animals and plants live in different habitats • recognise that environments can change and that this can sometimes pose dangers to living things • describe how humans can cause changes to environments 	<p>Predator, prey, producer, river, ocean, desert, arctic, rainforest, mountain, farmland, wood, dry, wet, vegetation, shelter, vertebrate, invertebrate, classify, characteristic, flowering plant, non-flowering plant (fern, moss)</p>

	<ul style="list-style-type: none"> • <i>explain why it is necessary to use a reasonably large sample when investigating the preferences of small invertebrates</i> • explain that different organisms are found in different habitats because of differences in environmental factors • <i>describe how humans have negatively impacted environments (e.g. pollution, deforestation, introduction of invasive species)</i> 	
Y5 Life Cycles	<ul style="list-style-type: none"> • sequence the life cycles of a variety of plants and animals • recognise the similarities in the life cycles of plants, animals and humans • <i>describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</i> • name the parts of a flower • describe the functions of some parts of a flower • describe the main functions of parts of a plant involved in reproduction • describe the processes of sexual and asexual reproduction in plants • name the parts of the human reproductive system • describe the simple functions of parts of the human reproductive system • <i>describe the life process of reproduction in some plants and animals</i> • compare methods of seed dispersal • know that most animals reproduce by sexual reproduction • <i>compare internal and external fertilisation in animals</i> • <i>explain that living things need to reproduce if the species is to survive</i> • <i>compare gestation periods (pregnancy) of different animals</i> • <i>explain what is unusual about the life cycle of a kangaroo or koala</i> 	Live young, hatch, tadpole, caterpillar, butterfly, ladybird, pupae, larvae, chrysalis, reproduction, asexual, sexual, life cycle, pollination, seed dispersal, pollen, stamen, stigma
Y6 Classification & Micro-organisms	<ul style="list-style-type: none"> • recognise that there is a wide variety of living things • understand why classification is important • identify vertebrates and invertebrates • name and describe the five vertebrate groups • <i>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</i> • <i>devise own keys to classify organisms and objects</i> • <i>give reasons for classifying plants and animals based on specific characteristics</i> • <i>describe early ideas about classification (e.g. Aristotle)</i> • understand there are living things that are too small to be seen and these can affect our lives • recognise that there are many micro-organisms, some which can cause illness or decay • recognise that there are useful micro-organisms which can be used in food production • describe how micro-organisms feed, grow and reproduce like other organisms 	Micro-organism, microbe, fungus, bacteria, virus, classified, classification key, yeast, characteristic, microscope

<p>Adaptation, Evolution and Inheritance</p>	<ul style="list-style-type: none"> describe evidence, from investigations, that yeast is living explain how micro-organisms can move from one food source to another or from one animal to another <i>compare the rate of reproduction in microorganisms to other animals</i> <i>describe how the development of the microscope has contributed to our understanding of microorganisms</i> <i>describe how ideas about hygiene have changed over time (e.g. Semmelweis)</i> <ul style="list-style-type: none"> recognise variation in different species (e.g. dogs, horses) recognise that offspring have some of the features of their parents recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents recognise that animals have to compete for food describe how animals avoid predators (e.g. speed, camouflage) describe how animals and plants are adapted to their environments identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution explain how being well adapted to an environment means an organism is more likely to survive <i>explain that animals which are better adapted to an environment are more likely to survive, reproduce and pass on characteristics to their offspring meaning the animal species will gradually change and evolve (giraffe with the tallest neck could reach more leaves to feed on)</i> recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago explain why we do not have a complete fossil record <i>describe the story of the peppered moth and how this provides evidence for natural selection</i> <i>explain how antibiotic resistant bacteria provide evidence for natural selection</i> <i>explain why we can see evidence for natural selection in fast reproducing organisms like bacteria (e.g. antibiotic resistant bacteria and pesticide resistant insects)</i> <i>explain how the introduction of a new species to an isolated environment can effect native species (e.g. Dodo, Kakapo or Stephen's island wren)</i> <i>compare the ideas of Darwin and Lamarck on evolution</i> 	<p>Variety, variation, offspring, species, competition, adapt, adaptation, reproduce, survive, evolve, fossil record, gills, blubber, moulting, long neck, hooves, eyelashes, tails, generation</p>
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Materials

	Expectations	Key words
EYFS Objects	<ul style="list-style-type: none"> make observations of common objects make very simplistic observations of materials arrange materials into groups 	Hard, soft, rough, smooth, wood, plastic, glass, fabric, metal, water, rock.

	<ul style="list-style-type: none"> • identify when changes occur e.g. when food is cooked 	
Y1 Everyday Materials	<ul style="list-style-type: none"> • name some common materials • name some common objects around the school and home • distinguish between an object and the material from which it is made • <i>name materials which have lots of different uses (e.g. paper- wrapping paper, tissue paper, writing paper, birthday card)</i> • identify some naturally occurring materials: wood, rock, water • identify some man-made materials: glass, metal, plastic • identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock • <i>describe objects that are made from lots of different materials</i> • <i>names objects that are sometimes made from different materials (e.g. spoons- plastic, wooden, metal)</i> • make observations of common objects and the different materials they are made of • communicate these observations using descriptive words (e.g. <i>bendy, rough, hard</i>) • identify some properties of materials (e.g. see through, waterproof, absorbent) • describe the simple physical properties of a variety of everyday materials • <i>make predictions about which materials will float and sink</i> • compare and group together a variety of everyday materials on the basis of their simple physical properties (both visible and non-visible) • <i>explain why people started using plastic bags rather than paper bags</i> 	Hard, stiff, rough, not bendy, opaque, strong, soft, shiny, smooth, waterproof, stretchy, material, transparent, dull, bendy, absorbent, wood, plastic, glass, magnetic, elastic, fabric, metal, water, rock,
Y2 Uses of Everyday Materials	<ul style="list-style-type: none"> • identify uses of some common materials • give a reason why a material is suitable for its job • recognise that some materials will have more than one property which increases its suitability for its purpose (e.g. glass is transparent, rigid and weatherproof) • identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses • suggest several reasons why a material may or may not be suitable for a particular purpose • <i>explain why one material may be more suitable for a purpose than another by discussing properties</i> • <i>explain why plastics cause problems in the oceans</i> • <i>explain the importance of reusing and recycling plastic</i> • <i>describe how swimsuits have changed over time and how the fabric is now more suitable</i> • <i>describe how scientists have invented new materials (e.g. Macintosh, Dunlop)</i> • identify materials that can be easily changed with force • identify materials that cannot be easily changed with force • describe pushes and pulls needed to change a material as big or small • find out how the shapes of solid objects made from some materials can be changed by squashing, 	Brick, cardboard, transparent, waterproof, insulate, keep warm, hard, rigid, strong, flexible, squash, stretch, twist, bend

	<p>bending, twisting and stretching</p> <ul style="list-style-type: none"> describe changes in shapes as a result of the action of pushes, pulls and twists <i>explain why some materials change shape when a force acts (i.e. push, pull, twist, stretch) as a result of their properties</i> 	
Y3 Rocks, Fossils and Soil	<ul style="list-style-type: none"> observe the characteristics of a variety of rocks name and describe the characteristics of several rocks identify fossils in rocks classify rocks from the evidence of investigations explain that rocks are used for different purposes dependent on their physical properties explain that different types of rock react differently to physical forces (e.g. water, rubbing) compare and group together different kinds of rocks on the basis of their appearance and simple physical properties understand that there are rocks under the Earth's surface <i>relate the simple physical properties of some rocks to their formation</i> <i>explain why certain rocks are used for different purposes and why some rocks could be used for these jobs for example:</i> <ul style="list-style-type: none"> <i>Marble- kitchen worktops or statues</i> <i>Slate roof tiles</i> <i>Granite walls</i> <i>explain how a model (e.g. biscuits, chocolate bars) can be used to represent sedimentary, metamorphic and igneous rocks</i> <i>explain why we might find lots of the same types of rock in one place</i> describe in simple terms how fossils are formed when things that have lived are trapped within rock <i>describe how Mary Anning discovered fossils</i> <i>explain why we do not see the soft parts of animals in fossils</i> recognise that soil is a mixture of different materials and living things recognise that soil contains dead plants and animals recognise that there is rock under all surfaces and that soils come from rocks recognise that soils are made from rocks and organic matter 	Rock, soil, marble, granite, sand, stone, slate, chalk, clay, texture, absorbed, permeable, pebble, characteristic, surface, organic, impermeable, crystal, grains, crumbly, igneous, sedimentary, metamorphic, fossil,
Y4 States of Matter	<ul style="list-style-type: none"> name some solids and liquids state that air is a gas state some differences between solids, liquids and gases recognise everyday substances as mixtures of solids, liquids and/or gases 	Water, air, ice, milk, lemonade, juice, metal, solid, liquid, gas, pour, flow, change shape, squash, heat, cool, grain/granular,

	<ul style="list-style-type: none"> • recognise that air is a material and that it is one of a range of gases which have important uses • recognise that gases flow from place to place • know that gases can be easily compressed • describe the differences between solids and liquids • <i>describe the behaviour and properties of gases</i> • compares simple solids and liquids (e.g. in terms of ease of squashing or pouring) • compare and group materials together, according to whether they are solids, liquids or gases • <i>make clear distinctions between the properties of solids, liquids and gases</i> • <i>explain why granular solids have some of the properties associated with liquids</i> • <i>explain why some substances are hard to classify as solids, liquids and gases (e.g. whipped cream, mousse, mayonnaise, muddy water, fizzy drinks, cornflour and water)</i> • observe what happens to a variety of materials when they are heated (e.g. chocolate, ice cream, butter, water) • identify a wide range of contexts in which changes of state take place describe a few examples where these changes occur • recognise that for a substance to be detected by smell, some of it must be in the gas state • 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) • <i>compare the boiling point of different liquids</i> • state that ice, water and steam are the same material • identify the processes of melting, freezing, evaporation and condensation • describe what happens to water when it is heated and cooled • recognise that these processes can be reversed • describe how when ice melts it turns to liquid and how when water freezes it becomes ice • describe how these processes can be reversed • describe how liquids evaporate to form gases and how gases condense to form liquids • sequence the changes that happen in the water cycle • describe the water cycle in terms of these processes • explain the relationship between liquids and solids in terms of melting and freezing • explain the relationship between liquids and gases in terms of evaporation and condensation • identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature • know that temperature can affect the rate of evaporation or condensation • describe the effect of temperature on evaporation • explain how changing conditions affects processes such as evaporation and condensation • identify a range of contexts in which changes take place (e.g. evaporation of puddles in the school 	<p>temperature, thermometer, freeze, melt, boil, evaporate, condense, steam, smoke, sea water, properties, melting point, degrees Celsius,</p>
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	<p>playground or from clothes on a washing line, condensation in the bathroom)</p> <ul style="list-style-type: none"> • <i>explore the effect of salt on ice</i> • <i>explain why salt is put on the roads in winter</i> 	
<p>Y5 Properties and Changes</p>	<ul style="list-style-type: none"> • observe and explore the properties of materials (e.g. hardness, transparency, magnetism, electrical and thermal conductivity) • identify some materials that are good thermal insulators and some everyday uses of these • recognise that metals are both good thermal and good electrical conductors • suggest why particular materials are used for different jobs depending on their properties • 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 • give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic • <i>describe the properties of new materials (e.g. aerogel, silly putty, wrinkle-free cotton)</i> • <i>explain why some materials are good thermal insulators</i> • recognise that salt or sugar dissolves in water but sand won't • name some materials that will and some that will not dissolve in water • recognise that although it is not possible to see a dissolved solid, it remains in the solution • describe melting and dissolving and give everyday examples of each • <i>describe the difference between melting and dissolving</i> • identify and explore factors that affect the rate at which a solid dissolves • recognise that an undissolved solid can be separated from a liquid by filtering • recognise that a solid can be recovered from a solution by evaporation • describe the properties of mixtures which can be separated by filtration • describe some methods that are used to separate simple mixtures • explain that when solids dissolve they break up so small they can pass through the holes in the filter paper • know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution • use knowledge about how a specific mixture can be separated to suggest ways in which other similar mixtures might be separated • use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating • <i>recognise that inks and dyes are often mixtures of different colours and these can be separated by chromatography</i> 	<p>Hardness, solubility, transparency, conductivity, thermal, insulation, dissolve, solution, separation, polymers, reversible, irreversible, evaporating, melting, evaporation, filtering, sieving, , dissolving, burning, rusting, vinegar, bicarbonate of soda, magnetism, insulators, conductors, soluble, insoluble</p>

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| | <ul style="list-style-type: none">• <i>explain why ink or dye moves up the paper in chromatography</i>• recognise that dissolving is a reversible change• recognise that some changes can be reversed and some cannot• recognise that changes of state are reversible• demonstrate that dissolving, mixing and changes of state are reversible changes• observe and explore a variety of chemical changes (e.g. burning)• identify whether some changes are reversible or not• recognise dissolving as reversible• classify some changes as reversible (<i>e.g. dissolving</i>) and others as irreversible (<i>e.g. burning</i>)• recognise that irreversible changes often make new and useful materials• recognise the hazards of burning materials• describe what happens when acid and bicarbonate of soda are mixed• 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• explain that in some cases the new materials made are gases and identify some evidence for the production of gases (e.g. vigorous bubbling) | |
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Light and sound

	Expectations	Key words
EYFS Senses (PSED – Life Skills – Keeping Yourself Safe)	<ul style="list-style-type: none"> • know that it is dangerous to look at the sun • relate their sense of sight to their eyes • relate their sense of hearing to their ears 	
Y3 Light and Shadows	<ul style="list-style-type: none"> • name a number of light sources, including the sun • describe and compare some light sources • state that light sources are seen when light from them enters the eyes • recognise that light from the sun can be dangerous and that there are ways to protect their eyes • recognise that they cannot see in the dark • recognise that light travels from a source • recognise that they need light in order to see things and that dark is the absence of light • explain that places are dark because there is no light and a light source is needed to help us see in such places • notice that light is reflected from surfaces • state that reflections can be seen in shiny surfaces • makes generalisations about shiny surfaces (e.g. smooth) • demonstrate light travelling using a torch and record light bouncing off a mirror • identify suitable reflective clothing for travelling in the dark • explain that they cannot see shiny objects in the dark because there are no light sources • recognise that when light is blocked, a shadow is formed • recognise that shadows are formed when the light from a light source is blocked by a solid object • recognise that shadows are similar in shape to the objects forming them • make observations of changes in shadows • explain that shadows are formed when light from a source is blocked • state that even transparent objects block some light and form shadows • describe the difference in shadows cast by opaque, translucent and transparent materials • explore how to make shadows of different shapes and sizes • find patterns in the way that the size of shadows change • <i>use ideas about shadows to make predictions about the shadows formed by different objects or materials</i> • <i>describe how the length of a shadow changes throughout the day as the sun moves across the sky</i> • <i>describe how nocturnal animals are adapted to use what little light there is or their other senses in the dark (e.g. cats, aye-aye, lemurs)</i> • <i>describe how Percy Shaw invented cat's eyes and explain their importance to road safety</i> 	Shadow, light, flames, opaque, block, direction, light, travels, shortest, longest, highest, torch, shape, similar, transparent, translucent, light source, sun, object daytime, night-time, reflect, shine, shiny, absorb, reflective surface, surface, mirror, sundial, block, lamp

<p>Y4 Sound</p>	<ul style="list-style-type: none"> • recognise and describe many sounds and sound sources • state that they hear sounds through their ears • recognise that when sounds are generated by objects, something moves or vibrates • identify how sounds are made, associating some of them with something vibrating • identify what is vibrating in a range of musical instruments • generalise that sounds are produced when objects vibrate • describe how sounds are generated by specific objects • suggest ways of producing sounds • recognise that vibrations from sounds travel through a medium to the ear • <i>recognise that sounds travel through solids, water and air</i> • <i>explore how sound travels through a variety of materials</i> • distinguish between pitch and volume (loudness) • describe differences in pitch and volume • find patterns between the pitch of a sound and features of the object that produced it • know that altering vibrations alters the pitch or volume • <i>describe ways in which the pitch of a sound made by a particular instrument or vibrating object can be raised or lowered</i> • <i>generalise the effects of changes on sound (e.g. the tighter the tension the higher the pitch)</i> • explore how to vary the pitch and volume of sounds from a variety of objects or instruments • find patterns between the volume of a sound and the strength of the vibrations that produced it • suggest how to change the loudness of the sounds produced by a range of musical instruments • recognise that sounds get fainter as the distance from the sound source increases • describe what they observe when they move further away from a source of sound • <i>group instruments independently by the way sounds are produced</i> • <i>identify suitable materials to use for sound insulation</i> • <i>recognise that sound can be reflected from a surface which can cause an echo</i> • <i>describe how some animals use echo-location</i> 	<p>Sound, pitch, volume, vibrations, medium, insulation, travel, instrument</p>
<p>Y6 How Light Travels</p>	<ul style="list-style-type: none"> • explore how light travels using torches and periscopes • recognise that light appears to travel in straight lines • describe reflection as light 'bouncing off' objects • understand that in order to be seen, all non-luminous objects must reflect light • diagrammatically represent light from sources and bouncing off reflective surface using arrows • 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 • draw diagrams to illustrate how light is travelling from the source to the eye • use the idea that light travels in straight lines to explain that objects are seen 	<p>Reflection, transparent, translucent, opaque, periscope, luminous, non-luminous, absorb, direction</p>

	<p>because they give out or reflect light into the eye</p> <ul style="list-style-type: none"> describe a variety of ways of changing the size of the shadow produced by an object describe the relationship between the size of a shadow and the distance between the light source and an object diagrammatically represent the formation of shadows using arrow convention use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them <i>know that, when sunlight passes through some objects, coloured light is produced (for example in rainbows, soap bubbles and prisms)</i> <i>describe how curved mirrors distort a reflection</i> 	
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Forces

	Expectations	Key words
EYFS Moving	<ul style="list-style-type: none"> observe and describe movements they and objects make 	Push, pull, twist, squash, stretch
Y3 Forces and Magnetism	<ul style="list-style-type: none"> recognise that pushes and pulls are forces recognise that a force acts in a particular direction observe the movements, shape and direction of objects when forces act on them describe how to make a familiar object start moving by pushing or pulling describe how to use pushes and pulls to make familiar objects speed up, slow down, change direction or shape produce annotated drawings showing the direction of force needed to make an object move identify friction as a force observe and explore how friction affects the movement of objects describe some ways in which friction between solid surfaces can be increased or decreased compare how things move on different surfaces observe how magnets attract or repel each other and attract some materials and not others classify materials as magnetic or non-magnetic 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 the difference between a magnet and a magnetic material notice that some forces need contact between two objects, but magnetic forces can act at a distance describe what happens when some materials are put near a magnet recall that magnets have a north and a south pole describe magnets as having two poles describe the direction of forces between magnets predict whether two magnets will attract or repel each other, depending on which poles are facing <i>describe some everyday uses of magnets</i> 	Force, push, pull, speed up, slow down, change shape, change direction, movement, direction, friction, magnets, magnetic, surface, magnetism, north pole, south pole, repel, attract,

	<ul style="list-style-type: none"> • <i>explain that a compass works by lining up with the Earth's magnetic field</i> • <i>describe how lodestone was found to be a naturally occurring magnet and was used as the first compass for navigation</i> 	
Y5 Earth and Space	<ul style="list-style-type: none"> • identify and name the components of the solar system (i.e. Sun, Moon, Earth and other planets) • locate the Sun, Earth and other planets in the solar system • recognise that the Earth and other planets orbit the Sun • recall that the Earth takes one year to orbit the Sun • recall that the Earth rotates on its' axis and this takes one day • describe the movement of the Earth, and other planets, relative to the Sun in the solar system • <i>use simple physical models to explain effects that are caused by the movement of the Earth</i> • recognise that the Moon orbits the Earth • <i>explain that gravity is a force of attraction and it is what holds the planets in orbit around the Sun and the Moon in orbit around the Earth</i> • describe the movement of the Moon relative to the Earth • <i>explain that the changes in the appearance of the Moon over a period of 28 days arise from the Moon orbiting the Earth once every 28 days</i> • describe the Sun, Earth and Moon as approximately spherical bodies • recognise that the Earth, Sun and Moon are spherical and support this with some evidence • recognise that it is daylight in the part of the Earth facing the Sun • recall that a shadow from the Sun changes over the course of a day • explore and describe how a shadow from the Sun changes over the course of a day • explain in terms of the rotation of the Earth why shadows change and the Sun appears to move across the sky during the course of the day • use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky • explain why it is night time in Australia when it is day time in England • <i>explain how ideas about the solar system have changed over time</i> 	Earth, Sun, planet, Mercury, Venus, Mars, Jupiter, Moon, Saturn, Uranus, Neptune, solar system, spherical, moon, day and night, celestial body, rotation, hemisphere, orbit, gravity, shadow, daylight
Forces	<ul style="list-style-type: none"> • identify weight as a force • identify that force is measured in Newtons • name simple forces such as gravity, friction and air resistance • recognise that more than one force can act on an object • draw force diagrams with arrows showing the direction of forces acting on an object • observe and explore the effect of several forces on objects 	force, air resistance, water resistance, magnetic attraction, gravitational attraction, direction, force, motion, weight, upthrust, Newton, forcemeter,

	<ul style="list-style-type: none"> • recognise that air resistance slows things down • recognise that friction can be useful or not useful • identify the effects of air resistance, water resistance and friction, that act between moving surfaces • describe some situations in which there is more than once force acting on an object • describe and explain the motion of some familiar objects in terms of several forces acting on them • identify forces on an object as either balanced or unbalanced • use the terms ‘balanced’ and unbalanced’ when describing several forces on an object • explain that balanced forces on an object cause it to remain stationary or travel at the same speed • explain that unbalanced forces on an object cause it to speed up, change shape or slow down • explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object • understand that air resistance is the frictional force of air on objects moving through it • describe some of the factors that increase friction between solid surfaces and increase air and water resistance • describe situations in which frictional forces are helpful as well as those in which frictional forces are unhelpful • <i>compare the tread on bicycle tyres according to how much friction they need</i> • <i>identify streamlined objects and describe why they have been designed in this way (e.g. cycling helmets, formula 1 cars, dolphins)</i> • explore the effects of levers, pulleys and gears • recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect • <i>describe how levers, pulleys and gears are used in everyday life (e.g. describe how having gears can make it easier to pedal a bike, how a bottle opener makes it easier to open a bottle lid)</i> • <i>explain how introducing gears onto bikes has changed cycling</i> 	stationary, surface area, force applied, pulley, lever, gear
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Electricity

	Expectations	Key words
EYFS	<ul style="list-style-type: none"> • know electricity can be dangerous • explore a range of battery powered devices 	Battery, electricity, switch
Y4 Circuits and Components	<ul style="list-style-type: none"> • identify common appliances that run on electricity • identify mains operated and battery operated devices • describe some of the dangers associated with mains electricity • name some components of a simple electrical circuit • know that batteries are sources of electricity • recognise that for a circuit to work it must be complete • construct a working circuit 	Battery, cell, wires, switch, crocodile clips, buzzer, bulb, circuit, symbols, insulator, conductor, plastic, metal, appliance, component

	<ul style="list-style-type: none"> • construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers • make drawings of simple working circuits (pictorial only circuit symbols covered in year 6) • make circuits from drawings provided • 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 • <i>are methodical in tracing faults in simple circuits</i> • describe the effect of making and breaking one of the contacts on a circuit • explain why some circuits work and others do not • recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit • describe how switches work • construct a home-made switch • identify materials as conductors or insulators • construct simple circuits and use them to test whether materials are electrical conductors or insulators • recognise some common conductors and insulators, and associate metals with being good conductors • <i>relate knowledge about metals and non-metals to their use in electrical appliances</i> • <i>describe the use of conductors and insulators in components including connecting wires</i> • <i>identify playdough and graphite as non-metal conductors and explain why this is unusual</i> 	
Y6 Circuits	<ul style="list-style-type: none"> • know that the 'amount' of electricity (voltage) depends on the number of batteries • construct some working series circuits with specified components • recognise conventional circuit symbols • use recognised symbols when representing a simple circuit in a diagram • draw circuit diagrams and construct circuits from diagrams using conventional symbols • explore how to change the brightness of bulbs and the volume of a buzzer • describe ways of changing the brightness of a bulb in a circuit or the volume of a buzzer • compare different circuits (e.g. for brightness of bulb) • recall that the amount of electricity is measured in voltage • 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 • <i>explore the thickness of a wire in a circuit</i> • <i>describe the differences between wires usually used for circuits and fuse wires</i> • <i>describe what would happen if all the lights in a home were connected in the same circuit and one broke</i> • <i>explain the current in circuits using simple models and analogies (e.g. piped water, bicycle chain, children and sweets)</i> 	Voltage, current, series, component, circuit, conductor, positive/negative terminal, complete circuit, battery, cell

Progression in Disciplinary Knowledge (Working scientifically)

KS1 & KS2

	Expectations – Questioning, exploration, communication	Expectations – Scientific method	Expectations – Recording data / analysis	Expectation – Equipment use / Investigation skills
EYFS	<ul style="list-style-type: none"> • Ask simple questions • Make and record observations using simple language • Similarities and differences. • Identifying and classifying 	<ul style="list-style-type: none"> • I can observe changes over time • I can observe changes and patterns • I can identify and classify • I can perform simple tests • I can perform a fair test with adult support 	<ul style="list-style-type: none"> • Draw pictures and label • Record observations and data in ways that are important and meaningful to me. 	<ul style="list-style-type: none"> • Magnifying glasses • Simple measuring equipment
				<ul style="list-style-type: none"> • Measure out ingredients
Y1	<ul style="list-style-type: none"> • Asking simple questions. • Suggest different ways of answering a question. • Making observations using simple language. • Making observations using keyword vocabulary. • Answering questions using simple language. • Noticing patterns and relationships 	<ul style="list-style-type: none"> • I can observe changes over time • I can observe changes and patterns • I can identify and classify • I can perform simple tests • I can perform a fair test with adult support 	<ul style="list-style-type: none"> • Gather and record data • Use simple scientific language with help • Draw pictures and label • Use simple tables to classify findings 	<ul style="list-style-type: none"> • Hand lenses • Egg timers • Simple measuring equipment
				<ul style="list-style-type: none"> • Observe closely using simple equipment
Y2	<ul style="list-style-type: none"> • Asking simple questions • Suggest different ways of answering a question. • Making observations using simple language. • Making observations using keyword vocabulary. 	<ul style="list-style-type: none"> • I can use simple equipment to observe closely including changes over time • I can use observations and ideas to suggest answers to questions noticing similarities, differences and patterns 	<ul style="list-style-type: none"> • Gather, record and answer questions using data incl. secondary sources • Draw pictures and label • Use more detailed tables to classify 	<ul style="list-style-type: none"> • Hand lenses • Egg timers • Simple measuring equipment •

	<ul style="list-style-type: none"> • Answering questions using simple language. • Noticing patterns and relationships – making connections to previous learning and/or experience • Communicate ideas in different ways 	<ul style="list-style-type: none"> • I can identify, group and classify • I can perform simple comparative tests • I can gather and record data to help in answering questions including from secondary sources of information 	<p>findings</p> <ul style="list-style-type: none"> • Gather, record, classify an using data incl. secondary sources • Present data in a variety of ways • Labelled diagrams • Tables • Bar charts • Keys 	<ul style="list-style-type: none"> • Observe closely, using simple equipment, changes over time • Ask questions about what I notice
Y3	<ul style="list-style-type: none"> • Begin to describe and explain observations and data • Sequence data • Ask and answer relevant questions in different ways using scientific language. • Notice and question patterns and relationships in the data 	<ul style="list-style-type: none"> • I can make systematic and careful observations over time • I can ask questions surrounding patterns I have found in data. • I can gather, record, classify and present data in a variety of ways • I can set up simple practical enquiries, comparative and fair tests • I can use secondary sources with adult support to help clarify results seen. 	<ul style="list-style-type: none"> • Gather, record, classify and present data incl. secondary sources • Present data in a variety of ways with increasing accuracy • Labelled diagrams • Tables • Bar charts • Keys 	<ul style="list-style-type: none"> • A range of measuring equipment using standard units.
Y4	<ul style="list-style-type: none"> • Describe and explain observations and data • Sequence data • Ask and answer relevant questions in different ways using scientific language and scientific enquiry 	<ul style="list-style-type: none"> • I can make systematic and careful observations over time, looking at similarities and differences. • I can ask questions surrounding patterns I have found in data. 	<ul style="list-style-type: none"> • Gather, record, classify and present data to help answer questions • Present data in a variety of ways with increasing accuracy 	<ul style="list-style-type: none"> • Set up practical enquiries, comparative and fair tests • Make systematic and careful observations over time.
				<ul style="list-style-type: none"> • A range of measuring equipment

	<ul style="list-style-type: none"> • Notice and question patterns and relationships in the data • Develop a deeper understanding through talk, asking questions about scientific phenomena, analysing functions and interactions more systematically. 	<ul style="list-style-type: none"> • I can gather, record, classify and present data in a variety of ways to help in answering questions • I can set up simple practical enquiries, comparative and fair tests • I can use secondary sources with adult support to help clarify results seen. 	<ul style="list-style-type: none"> • Labelled diagrams • Tables • Bar charts • Keys 	<ul style="list-style-type: none"> • Measuring with increasing accuracy and precision. • Set up practical enquiries, comparative and fair tests
Y5	<ul style="list-style-type: none"> • Plan different types of scientific enquiries to answer questions, including recognising variables where necessary • Ask questions surrounding patterns found in data as to why something observed has happened. • Observe over time, asking pertinent questions about similarities and differences. 	<ul style="list-style-type: none"> • I can observe over time, asking pertinent questions about similarities and differences. • I can ask questions surrounding patterns I have found in data as to why something I have observed has happened. • I can classify, group and present data in a series of ways to help in answering questions • I can take measurements, using a range of scientific equipment, with increasing accuracy and precision. • I can use secondary sources to help interpret results seen. 	<ul style="list-style-type: none"> • Record data and results to answer questions and set up further comparative and fair tests. • Scientific diagrams and labels • Classification keys • Tables • Scatter graphs • Bar and line graphs 	<ul style="list-style-type: none"> • A range of measuring equipment • Thermometers • Data loggers
Y6	<ul style="list-style-type: none"> • Plan different types of scientific enquiries to answer my own or others' questions, including recognising and controlling variables where necessary • Recognise things change over time, and can ask pertinent questions and suggest reasons for similarities and differences over time 	<ul style="list-style-type: none"> • I can recognise things change over time, and can ask pertinent questions and suggest reasons for similarities and differences over time • I can ask questions surrounding patterns I have found in data as to why something I have observed has happened. 	<ul style="list-style-type: none"> • Record data and results to make predictions to set up further comparative and fair tests. • Scientific diagrams and labels • Classification keys • Tables 	<ul style="list-style-type: none"> • A range of scientific equipment • Thermometers • Data loggers

		<ul style="list-style-type: none"> • I can develop and use keys and other information to classify and describe objects in ways to help answer questions • I can take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • I can use secondary sources to help interpret results seen. 	<ul style="list-style-type: none"> • Scatter graphs • Bar and line graphs 	<ul style="list-style-type: none"> • Increasingly accurate measurements and repeat readings, using standard units • Make own decisions and select the most appropriate type of scientific enquiry to use and recognise how to set up a comparative and fair test.
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Progression in Disciplinary Knowledge (Working scientifically)

KS2 (only) Reporting and Using Findings

	Expectations – Reporting	Expectations – Using Data
Y3	<ul style="list-style-type: none"> Report on findings from enquiries, using presentations of results and conclusions Use results to draw simple conclusions. Use secondary sources with adult support to help clarify results seen. 	<ul style="list-style-type: none"> Identify differences, similarities or changes related to simple scientific ideas and processes Use straightforward scientific evidence to answer questions or to support my findings
Y4	<ul style="list-style-type: none"> Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions Use results to draw simple conclusions, make predictions for new values and suggest improvements. Use secondary sources with adult support to help clarify results seen. Classify, group and present data in a series of ways to help in answering questions 	<ul style="list-style-type: none"> Identify differences, similarities or changes related to simple scientific ideas and processes Use straightforward scientific evidence to answer questions or to support my findings
Y5	<ul style="list-style-type: none"> Report and present findings from enquiries, in oral and written forms such as displays and other presentations. Use results to draw more complex conclusions, make predictions for new values and suggest improvements. Use secondary sources to help interpret results seen. Classify, group and present data in a series of ways to help in answering questions 	<ul style="list-style-type: none"> Identify scientific evidence that has been used to support or refute ideas or arguments

Y6	<ul style="list-style-type: none">• Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.• Use results to draw more complex conclusions, make predictions for new values and suggest improvements and raise further questions.• Use secondary sources to help interpret results seen.• I can develop and use keys and other information to classify and describe objects in ways to help answer questions	<ul style="list-style-type: none">• Justify and evaluate own and other people’s scientific ideas related to topics in the national curriculum (including ideas that have changed over time), using evidence from a range of sources
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Progression in Disciplinary Knowledge (Working scientifically)

KS2 (only) Investigations, data collection and analysis

	Expectations – Planning investigations	Expectations – Data gathering and analysis	Expectations – Critical Evaluation
Y3	<ul style="list-style-type: none"> Name 3 each of Independent, Dependent and Control Variables Construct questions from chosen variables Identify variables in questions Make and justify predictions List equipment required for investigations Write the method for an investigation 	<ul style="list-style-type: none"> List the types of data that can be gathered in investigations. Decide the type of data being gathered in investigations. Complete provided results tables. Draw and complete own results tables. With help, draw a graph with an appropriate scale on the axes. Identify trends in the data gathered from investigations 	<ul style="list-style-type: none"> State the trend in the results. State whether the trend matched the prediction. Explain how the trend matched, or didn't match, the prediction. List the criteria needed to decide whether results gathered are valid or not. Explain whether results gathered were valid or not. Spot anomalies in the results gathered. Explain the reason for any anomalies in the data. Suggest how the method could be improved to obtain valid data. Suggest new questions that are related to the original investigation.
Y4	<ul style="list-style-type: none"> As Year3 Identify risks and mitigation associated with an investigation 	<ul style="list-style-type: none"> As Year 3 Draw and complete own results tables. Write conclusions 	<ul style="list-style-type: none"> As Year3 Suggest new questions that are related to the original investigation. Design an investigation that could produce similar results.
Y5	<ul style="list-style-type: none"> As Year 4 Produce a full plan for an investigation 	<ul style="list-style-type: none"> As Year 4 Draw own graphs from data gathered in investigations. 	<ul style="list-style-type: none"> As Year 4 Describe the criteria needed to decide whether results gathered are valid or not. Produce a full scientific report, including planning, data and evaluation.

Y6	<ul style="list-style-type: none">• As Year 5• Name 5 + of the 3 types of variable	<ul style="list-style-type: none">• As Year 5• Choose the most appropriate graph for the data gathered.• Produce a full data report.	<ul style="list-style-type: none">• As Year 5• Increased accuracy and detail in design of investigation, planning, data and evaluation
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