



Y5/6 Science Long Term Overview



Year 5/6	Autumn 1 <u>Life cycles</u>	Autumn 2 <u>Forces</u>	Spring <u>Materials and Separating mixtures</u>	Summer 1 <u>Classifying Living Things</u>	Summer 2 <u>Animals including humans</u>
Big Concepts					
Big Question	Do all life cycles look the same?	How do different forces change the movement of an object?	How do the properties of different materials make them suitable for different purposes? What methods can we use to separate different mixtures? What are reversible and irreversible changes?	How can living things be divided into groups?	What changes as humans develop from birth to old age?
Prior Knowledge	In Year 4 children should: - Construct and interpret a variety of food chains, identifying producers, predators and prey - 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.	In Year 3 children should: - Compare how things move on different surfaces. - Know how a simple pulley works and use making lifting an object simpler - Notice that some forces need contact between two objects, but magnetic forces can act at a distance. - Observe how magnets attract and repel each other and attract some materials and not others. - Compare and group together a variety of everyday materials based on whether they are attracted to a magnet and identify some magnetic materials. - Describe magnets as having two poles. - Predict whether two magnets with attract or repel each other, depending on which poles are facing.	EYFS - be able to ask questions about the place they live. Talk about why things happen and how things work. Discuss the things they have observed such as natural and found objects. Manipulates materials to achieve a planned effect. In KS1 children should: - Distinguish between an object and the material from which it is made. - Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. - Describe the simple physical properties of a variety of everyday materials. - Compare and group together a variety of everyday materials based on their simple physical properties. - Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. - Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching In Year 2 children should: - Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.	Y1 - 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 Y2 - Explore and compare the difference between things that are living, dead and things that have never been alive. Y4 - Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.	Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals, including humans)



Y5/6 Science Long Term Overview



			In Year 4 children should: • Compare and group materials together, according to whether they are solids, liquids or gases. • Observe that some materials change state when heated or cooled, and measure and research the temperature at which this happens in degrees Celsius. • Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.		
Overview of Knowledge	In this unit children will learn that plants and animals have life cycles and that reproduction is a part of this cycle. They will recognise that each life cycle has distinct stages but that these can vary between species, for example they may describe and contrast the stages of the human life cycle with three and four stage metamorphosis in insects and amphibians. They will understand the importance of reproduction for the survival of a species. Children will have the opportunity to undertake an educational visit to a botanic garden, zoological garden or a similar site to experience field study related to life cycles	In this unit children will have learnt about a variety of forces including gravity, air resistance, water resistance and friction. They will have explored how simple mechanisms can be used to make work easier. They will have observed and explained how gravity causes an unsupported object to fall towards the Earth. They will have researched the relative effects of the gravitational pull on other planets. Children will have carried out a range of activities to identify the effects of friction, air resistance, and water resistance and will consider ways of reducing water resistance through streamlining.	In this unit children will have compared and grouped together everyday materials on the basis of their properties, including their hardness, solubility, transparency, response to magnets and electrical and thermal conductivity. They will have given reasons, based on evidence from comparative and fair tests, for the particular use of everyday materials, including metals, wood and plastic. In this unit children will learn about the separation techniques of filtering, sieving and evaporation. They will use sieves to separate materials of different sizes. They will learn that some substances (such as candyfloss) dissolve in water whilst others (such as dried herbs) do not. They will learn that they can separate a dissolved solid from a solution through evaporation of the liquid. They will consolidate and apply their knowledge of the properties of solids, liquids and gases by separating different mixtures. children will explore dissolving by seeing how many drops of water it takes to dissolve the same amount of different substances and will use the terms solute and solvent. They will use evaporation to recover dissolved solutes and will recognise that these are reversible changes. They will also recognise that mixing and changes of state are reversible changes. Children will be introduced to examples of irreversible changes such as burning candles and other fuels, heating some materials and mixing bicarbonate with acid. They will learn that in these changes new materials are made and that these new materials are often in the form of gases.	In this unit children will learn about the classification of living things, including micro-organisms. The children will build on their previous learning by sorting animals into groups based on their similarities and differences. They will extend their learning to find out about the standard system of classification first developed by Carl Linnaeus, choosing an animal and researching its classification. The children will have the opportunity to design their own 'curious creature' and classify it based on its characteristics. They will learn about micro-organisms, and conduct an investigation into the growth of mould on bread. Furthermore, the children will use play dough to create a new single celled micro-organism and explain how it is classified and why. Finally, the children will put their learning into practice by creating a field guide to the living things in their local area, showing how and why each one is classified	Children will learn that when babies are young, they grow rapidly. They are very dependent on their parents. As they develop, they learn many skills. At puberty, a child's body changes and develops primary and secondary sexual characteristics. This enables the adult to reproduce.
Common misconceptions	Some children may think: • all plants start out as seeds • all plants have flowers • plants that grow from bulbs do not have seeds	Some children may think: • the heavier the object the faster it falls, because it has more gravity	Some children may think: • solids dissolved in liquids have vanished and so you cannot get them back Some children may think: • thermal insulators keep cold in or out	Some children may think: • all micro-organisms are harmful • mushrooms are plants.	Some children may think: • a baby grows in a mother's tummy • a baby is "made".



Y5/6 Science Long Term Overview



	only birds lay eggs.	acting on it • forces always act in pairs which are equal and opposite - smooth surfaces have no friction - objects always travel better on smooth surfaces - a moving object has a force which is pushing it forwards and it stops when the pushing force wears out - a non-moving object has no forces acting on it - heavy objects sink and light objects float.	thermal insulators warm things up Lots of misconceptions exist around reversible and irreversible changes, including around the permanence or impermanence of the change. There is confusion between physical/chemical changes and reversible and irreversible changes. They do not correlate simply. Chemical changes result in a new material being formed. These are mostly irreversible. Physical changes are often reversible but may be permanent. The shape, but not the material, has been changed.		
Working Scientifically	Children will plan and carry out investigations and observe, measure and record the growth of animals and/or plants over time. They will use secondary research to develop their understanding of life cycles in different species. They will draw conclusions from their investigations, and present their conclusions in a variety of ways including written and oral presentations.	Children will have found out how to measure using force meters and will have used this knowledge to investigate which shoes have the best grip and which shoes are most slippery. They will have used their results to form conclusions about which shoes create the most friction. They will have planned how to carry out a fair test on a paper spinner and will have investigated which sails use air resistance most effectively. Children will also have investigated different shaped hulls on boats and will have measured the force needed to lift weights using a simple lever.	Children will formulate their own question about dissolving before planning how they will answer it, predicting possible outcomes and carrying out a fair test. They will record their results in a table and graph, and interpret the results using evidence to support or refute their predictions. Children will use evidence gathered from their own and others' investigations into dissolving and evaporation to draw conclusions and offer explanations. They will apply previous understanding about melting to predict and investigate which substances will melt. They will plan, carry out and review a complete investigation related to the action of acid on bicarbonate. Children will have classified materials in different ways explaining their classification criteria. They will have planned, carried out and interpreted an investigation in trying to answer a question about the most suitable material for a given function.	Children will carry out investigations to observe how moulds grow over time. Children will use and construct classification keys to identify plants within their locality.	The children decide how to record and present evidence. They record observations e.g. using annotated photographs, videos, labelled diagrams, observational drawings, labelled scientific diagrams or writing.



Y5/6 Science Long Term Overview



Key Vocabulary	Life cycle, reproduction, asexual, sexual, animal, amphibians, reptiles, birds, mammals, invertebrates, insect, babies, young, grow, adult, egg, caterpillar, larva, chrysalis, pupa, wings, complete metamorphosis, incomplete metamorphosis, plants, seeds, stem, pollen, Leaves, flowers, petals, fruit, roots,, seed, stem, stigma, style, anther, ovary, ovule, seed formation, seed dispersal Humans, gestation, baby, child, teenager, adult, geriatric, puberty	Magnet, magnetism, force, motion, acceleration, deceleration, gravity, mass, weight, Newton, friction, air resistance, water resistance, balanced force, unbalanced force, mechanism, lever, gear, pulley	Separate, mixture, filter, sieve, sifting, evaporate, solid, liquid, gas, mixture, solution, dissolving, property, filtration, magnetism, attraction, repulsion, flotation, particles, heat, temperature, changes of state, soluble, insoluble, Property, solubility, transparency, transparent, flexibility, durability, magnetic, compare, group, classify, soft, hard, rough, smooth, stiff, shiny, dull, rough, waterproof, absorbent, opaque, translucent, texture, conduct, insulate, electrical, thermal, magnetic. Change, state, change of state, reversible, irreversible, dissolve, solute, solvent, solution, evaporation, mixing, substance, burning, ash, reaction, chemical reaction, solids, liquids, gases, substance, separated, filtering, sieving, evaporating, reversible, irreversible state, burning, oxygen, acid, bicarbonate of soda, carbon dioxide	Classification, classify, microorganisms, plants, animals, key, similarities, differences, species, reproduction, reproduce, decay, observe, characteristics, physical, branching, vertebrates, amphibians, reptiles, birds, mammals, invertebrates, insects, spiders, snails, worms, head, abdomen, thorax, wings, fur, feathers, scales, plants, kingdom, species	Puberty – the vocabulary to describe sexual characteristics Gestation, Fetus, Fertilisation, Species, Baby, Toddler, Adolescent, Adult, Elderly person, Puberty, Hormones, Pituitary gland, Testosterone, Estrogen
------------------------------	--	--	---	--	--