[1]Westwood and Grove Primary Schools

Science knowledge, skills and vocabulary

Revisit vocabulary from previous Key Stage when beginning a new topic, ensure this vocabulary is also embedded throughout teaching.

	Curriculum Programme				
	Learning Objective		**Knowledge (National Curriculum)**	**Skills**	**Technical Vocabulary and key concepts**
End of KS1	**Biology**	**To understand plants**	To know the names variety of common wild and garden plants, including deciduous and evergreen tree To know the basic structure of a variety of common flowering plants, including trees To understand how seeds and bulbs grow into mature plants To understand how plants need water, light and a suitable temperature to grow and stay healthy	To observe and record, with some accuracy, the growth of a variety of plants as they change over time from a seed or bulb. To observe similar plants at different stages of growth. To investigate that plants need light and water to stay healthy. To observe closely, compare and contrast familiar plants. To describe how plants can be identified and grouped. To research and draw diagrams showing the parts of different plants including trees. To record how plants have changed over time.	**Key concepts:** Deciduous, Evergreen leaf, flower, blossom petal, fruit, root, bulb, seed, trunk, branches, stem, berry, bark, stalk, bud Light, shade, sun, warm, cool, water, grow, healthy

[1] Updated December 2019

		To understand animals and human	To know the names of a variety of common animals including fish, amphibians, reptiles, birds and mammals including pets. To know the names of a variety of common animals that are carnivores, herbivores and omnivores To know the names of the basic parts of the human body and say which part of the body is associated with each sense To understand that animals including humans, have offspring which grow into adults To know the basic needs of animals, including humans, for survival (water, food and air) To understand humans of exercise, eating the right amounts of different types of food, and hygiene	To identify and classify a variety of animals that are birds, fish, amphibians, reptiles, mammals and invertebrates. To identify and compare the structure of common animals. To identify, name, draw and label parts of the body. To observe, compare and contrast animals. To identify and group animals according to what they eat. To investigate using their senses to compare different textures, sounds and smells. To observe and compare changes in humans and animals over time. To investigate and describe the basic needs of animals.	**Key concepts:** fish, amphibians, reptiles, birds and mammals tail, wing, claw, fin, scales, feathers, paw, beak, fur, hooves, warm blooded, cold blooded, eggs, gills, land, water head, body, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth baby, toddler, child, teenager, adult
		To investigate living things and their habitats	To know the differences between things that are living, dead, and things that have never been alive To understand that most living things live in habitats to which they are suited. To understand how different habitats, provide for the basic needs of different kinds of animals and plants. To understand how different habitats, provide for the basic needs of different kinds of animals and how they depend on each other To know the names of a variety of plants in their habitats, including microhabitats	To observe how different animals, including humans, grow To research what things animals need for survival and what humans need to stay healthy To identify and classify things according to whether they are living, dead or were never alive. To investigate a question and record their findings using charts. To research, describe and explain their decisions linked to their knowledge. To research and find out about the conditions in different habitats and microhabitats.	**Key concepts: food chain** habitat, microhabitat seashore, woodland, ocean, rainforest egg, chick, chicken; egg, caterpillar, pupa, living, dead, never been alive, suited, suitable, basic needs, food,, shelter, move, feed, producer, consumer, territory consumer, apex predator Names of areas in local habitats: Pond, woodland, logs, bushes etc

			To know the names of a variety of animals in their habitats, including microhabitats To know how animals, obtain their food from plants and other animals. To understand a simple food chain, and identify and name different sources of food.		
	Chemistry	**To investigate materials**	To know the differences between an object and the material from which it is made To know the names of a variety of everyday materials, including wood, plastic, glass, metal, water, and rock To know the simple physical properties of a variety of everyday materials To know the names of and be able to group variety of everyday materials on the basis of their simple physical properties To know the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses To understand how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	To compare the uses of everyday materials To observe closely, identify and classify the uses of different materials. To investigate and record their observations in a variety of ways. To perform simple investigations to explore questions.	**Key concepts: suitability, properties** object, material, brick, paper, fabrics, elastic, foil, wood, plastic, glass, metal, elastic, foil, card, cardboard, rubber, wool, clay, rock hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/floppy; waterproof/absorbent; breaks, tears, rough, smooth, shiny, dull, suitable/unsuitable, use/useful, rigid/flexible, strong/weak, transparent/opaque, shape, push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching.
	Physics	**To understand weather and seasonal changes**	To understand changes across the 4 seasons To know that weather is associated with the seasons and how day length varies	To make tables, charts and displays about the weather and what happens in the world around them.	**Key concepts: seasons- summer, winter, spring, autumn** Sunny, rainy, windy, snowy, winter, summer, spring, autumn, sun, sunrise, sun set, day length, weather, climate
End of LKS2	**Biology**	**To understand plants**	To know the functions of different parts of flowering plants. To know that plants need air, water, nutrients from soil, light and room to grow and that this varies from plant to plant. To understand the requirements of plants for life and growth and how	To investigate the effect of different factors on plant growth e.g. fertiliser, sunlight. To spot patterns in the structure of fruits that relate to how the seeds are dispersed. To observe how water is transported in plants. (e.g. by putting cut,	**Key concepts: Photosynthesis, pollination** pollen, insect/wind seed formation, seed dispersal – wind dispersal, animal dispersal, water dispersal, roots,nutrition **Revisit vocabulary taught in Key Stage 1.**

			these vary from plant to plant. To know how water is transported in plants. To understand the role of flowers in the life cycle of flowering plants including pollination, seed formation and seed dispersal.	white carnations into coloured water) To observe how water travels up the stem to the flowers. To investigate questions around the role of the roots and stem in nutrition and support of a plants lifecycle. (e.g. leaves for nutrition and flowers for reproduction)	
		To understand animals and human	To know that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food and they get nutrition from what they eat. To know humans and some other animals have skeletons and muscles for support, protection and movement. To understand the simple functions of the basic parts of the digestive system in humans To know the different types of teeth in humans and their simple functions To understand variety of food chains including understanding the role of producers, predators and prey To know parts of the body have special functions	To identify and classify animals with and without skeletons. To observe and compare animal's movement; exploring ideas about what would happen if humans did not have skeletons. To identify and compare the diets of different animals (including their pets) and decide ways of grouping them according to what they eat. To research different food groups and how they keep us healthy by designing meals based on what they find out. To research the main body parts associated with the digestive system.	**Key concepts: herbivore, carnivore, omnivore, digestive system** Digestion, mouth, teeth, tongue, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, teeth, incisor, canine, molar, muscles, plants, prey, predator, **Revisit vocabulary taught in Key Stage 1.**
		To investigate living things	To know living things can be grouped in a variety of ways To understand classification keys and use these to help group, identify and name a variety of living things in their local and wider environment To understand environments can change and that this can sometimes pose dangers to living things.	To identify and classify local plants and animals using simple guides or keys To observe animals in their habitats and use what they have found out to answer and ask questions. To research the human impact (both positive and negative) on environments. (e.g. the positive effects of nature reserves, ecologically planned parks, or garden ponds, and the negative effects of population and development, litter or deforestation) To identify and research plants and animals in their habitat. To observe how the habitat changes throughout the year.	**Key concept: Classification,** classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate, vertebrate, invertebrate, fish, amphibians, reptiles, birds, mammals, snail, slug, worm, spider, insect, skeleton, spine **Revisit vocabulary taught in Key Stage 1.**

				To identify and classify a range of living things that include animals and flowering plants and non-flowering plants. (e.g. vertebrate animals into groups such as fish, amphibians, reptiles, birds, and mammals; and invertebrates into snails and slugs, worms, spiders, and insects)	
	Chemistry	**To investigate materials (rocks and soils)**	To know different kinds of rocks can be grouped on the basis of their appearance and simple physical properties To understand in simple terms how fossils are formed when things that have lived are trapped within rock To know that soils are made from rocks and organic matter.	To research different rocks, including those used in buildings and gravestones and in the local environment. To research how and why rocks might have changed over time. To use a hand lens or microscope to help them to identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them. To research and discuss the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed. To investigate different soils in order to identify similarities and differences between them To investigate what happens when rocks are rubbed together and what changes occur when they are in water. To use research to raise and answer questions about the way soils are formed	**Key concept: rock formation** Rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, soil, fossil, marble, chalk, granite, sandstone, slate, soil, peat, sandy/chalk/clay soil, sedimentary, metamorphic, igneous,
		To investigate materials (states of matter)	To know materials can be grouped together according to whether they are solids, liquids or gases To understand that some materials change state when they are heated or cooled. To know the temperature at which this happens in degrees Celsius (°C) To know the role of evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	To identify and classify a variety of everyday materials to create simple descriptions. (e.g. solids hold their shape; liquids form a pool not a pile; gases escape from an unsealed container) To investigate the effect of temperature on substances such as chocolate, butter, cream. (e.g. to make food such as chocolate crispy cakes and ice-cream for a party). To research the temperature at which materials change state. (e.g. when iron melts or when oxygen condenses into a liquid)	**Key concepts: Water cycle - evaporation, condensation** Solid, liquid, gas, state change, melting, freezing, melting point, boiling point, evaporation, temperature, condensation,vapour, clouds, run- off, evaporate, condense, water, precipitation **Revisit vocabulary taught in Key Stage 1.**

				To observe and record evaporation over a period of time. (E.g. a puddle in the playground or washing on a line) To investigate the effect of temperature on materials.()E.g. on washing drying or snowmen melting) To observe water as a solid, a liquid and a gas and investigate the changes to water when it is heated or cooled.	
	Physics	**To understand movement, forces and magnets**	To know how things move on different surfaces To understand that some forces need contact between two objects, but magnetic forces can act at a distance To know how magnets attract or repel each other and attract some materials and not others To know a variety of everyday materials can be grouped and compared on the basis of whether they are attracted to a magnet, and identify some magnetic materials To know magnets as having two poles. To understand predict whether two magnets will attract or repel each other, depending on which poles are facing.	To identify and classify how different things move. To investigate how far things move on different surfaces, raising questions based on what they have found out. To research, gather and record data to find answers their own questions. To investigate the strengths of different magnets and find a fair way to compare them. To classify materials into those that are magnetic and those that are not. To spot patterns in the way that magnets behave in relation to each other and what might affect this. (e.g. the strength of the magnet or which pole faces another) To identify magnets are useful in everyday items and suggest creative uses for different magnets. To investigate the behaviour and everyday uses of different magnets. (e.g, bar, ring, button and horseshoe)	**Key concepts: magnetism** 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, surface, positive, negative **Revisit vocabulary taught in Key Stage 1.**
		To understand light	To understand that they need light in order to see things and that dark is the absence of light To know that light is reflected from surfaces. To understand and describe that light from the sun can be dangerous and that there are ways to protect their eyes. To understand how shadows are formed and what might cause these to change.	To spot patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes. To investigate and measure what happens to shadows when the light source moves or the distance between the light source and the object changes. To investigate that shadows are formed when the light from a	**Key concepts: Behaviour of light** Light, Light source, Dark, Absence of light, Transparent, Translucent, Opaque, Shiny, Matt, Surface, Shadow, Reflect, Mirror, Sunlight, Dangerous, absorption, **Revisit vocabulary taught in Key Stage 1.**

			To know how the size of shadows change.	light source is blocked by an opaque object To investigate what happens when light reflects. (e.g. off a mirror or other reflective surfaces, including playing mirror game) To use knowledge to answer questions about how light behaves.	
		To investigate sound and hearing	To understand how sounds are made, associating some of them with something vibrating To understand recognise that vibrations from sounds travel through a medium to the ear To know the pitch of a sound and features of the object that produced it can differ To know the volume of a sound and the strength of the vibrations that produced it can differ To understand that sounds get fainter as the distance from the sound source increases.	To spot patterns in the sounds that are made by different object. (e.g. saucepan lids of different sizes or elastic bands of different thicknesses) To investigate which provides the best insulation against sound. (e.g. make earmuffs from a variety of different materials to investigate.) To use research and what they have found out to make and play their own instruments. To identify the way sound is made through vibration in a range of different musical instruments from around the world. To investigate how the pitch and volume of sounds can be changed in a variety of ways.	**Key concept: Behaviour of sound** sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation, matter, echo, wave, amplitude **Revisit vocabulary taught in Key Stage 1.**
		To understand electrical circuits	To know appliances that run on electricity To understand a simple series electrical circuit. To know the names of the basic parts of a simple circuit. To know whether or not a lamp will light in a simple series circuit. To understand the term 'complete loop' circuit. To understand the role of a switch in a simple circuit. To know some common conductors and insulators, and know metals are good conductors.	To observe and spot patterns in simple circuits. (e.g. bulbs get brighter if more cells are added.) To investigate conductors and insulators. (e.g. that metals tend to be conductors of electricity, and that some materials can and some cannot be used to connect across a gap in a circuit.) To test and draw pictorial representations of simple series circuits. (e.g. trying different components; bulbs, buzzers and motors, and including switches, and use their circuits to create simple devices)	**Key concept: Electricity** Electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery,voltage, current, resistance, power, positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol cells, wires, bulbs, switches and buzzers **Revisit vocabulary taught in Key Stage 1.**
End of UKS2	**Biology**	**To understand animals and human**	To understand the changes as humans develop to old age. To know the stages of growth and development in humans and record this on a timeline.	To research the gestation periods of other animals and comparing them with humans. (e.g. by finding out and recording the length and mass of a baby as it grows) To research the work of scientists and scientific	**Key concepts:** Puberty, menstruation, reproduction, circulatory system Physical changes, Emotional changes, Moods, Periods, Tampons, Sanitary towels, Wet dreams , Semen, Erection,

			To know the changes experienced in puberty. To know the main parts of the human circulatory system. To know the functions of the heart, blood vessels and blood . To know the impact of diet, exercise, drugs and lifestyle on the way their bodies function. To understand the ways in which nutrients and water are transported within animals, including humans. To know how to keep their bodies healthy and how their bodies might be damaged. To know how some drugs and other substances can be harmful to the human body. To understand how the circulatory system enables the body to function.	research about the relationship between diet, exercise, drugs, lifestyle and health.	Sweat, Breasts, Spots, Pubic hair, Facial hair, Underarm hair,Womb, Sperm, Egg, Conception, Fertilisation, Pregnancy, Sexual intercourse , Twins, Fostering, Adoption, Relationship ,Friendship, Love, Consent, Intimacy, Sexual feelings, Privacy Human rights, Protection, Female Genital, Mutilation Heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, nutrients, water, muscles, cycle,exercise, drugs and lifestyle **Revisit vocabulary taught in Lower Key Stage 2.**
		To investigate living things	To understand the differences in the life cycles of a mammal, amphibian, an insect and a bird To understand the life process of reproduction in some plants and animals. To understand how living things are classified into broad groups according to common observable characteristics, similarities and differences. (microorganisms, plants and animals) To know and give reasons for classifying plants and animals based on specific characteristics.	To identify and classify animals into commonly found invertebrates and vertebrates. (insects, spiders, snails, worms, fish, amphibians, reptiles, birds and mammals). To research and raise questions about their local environment throughout the year To observe life-cycle changes in a variety of living things (e.g. plants in the vegetable garden or flower border, and animals in the local environment) To research the work of naturalists, animal behaviourists and pioneers (e.g. David Attenborough, Jane Goodall and Carl Linnaeus, a pioneer of classification.) To research different types of reproduction. (including sexual and asexual reproduction in plants, and sexual reproduction in animals) To observe and compare the life cycles of plants and animals in their local environment with other plants and animals around the world. (e.g.in the rainforest, in the	**Key concepts: Vertebrates,invertebrates** insects, spiders, snails, worms, flowering and non-flowering, **Revisit vocabulary taught in Lower Key Stage 2.**

				oceans, in desert areas and in prehistoric times) To ask pertinent questions and suggesting reasons for similarities and differences about plants around the world. To test growing new plants from different parts of the parent plant. (e.g. seeds, stem and root cuttings, tubers, bulbs) To observe changes in an animal over a period of time (e.g.by hatching and rearing chicks). To research and compare how different animals reproduce and grow. To identify some animals and plants in the immediate environment using classification systems and keys. To research unfamiliar animals and plants from a broad range of other habitats and decide where they belong in the classification system	
		To understand evolution and inheritance	To know that living things have changed over time. (i.e.that fossils provide information about living things that inhabited the Earth millions of years ago) To know living things produce offspring of the same kind. (note: normally offspring vary and are not identical to their parents) To understand how animals and plants are adapted to suit their environment in different ways. To know adaptation may lead to evolution.	To research how living things on earth have changed over time To research the idea of characteristics in evolution. (i.e. passed from parents to their offspring by considering different breeds of dogs, and what happens when. e.g.labradors are crossed with poodles) To research variation in offspring over time. (i.e can make animals more or less able to survive in particular environments, e.g. by exploring how giraffes' necks got longer, or the development of insulating fur on the arctic fox) To research the work of palaeontologists. (e.g. Mary Anning and about how Charles Darwin and Alfred Wallace developed their ideas on evolution)	**Key concept: Natural selection (adaptation)** Offspring, sexual reproduction, vary, characteristics, suited, adapted, environment, inherited, species, fossil, common ancestor **Revisit vocabulary taught in Lower Key Stage 2.**
	Chemistry	**To investigate materials**	To know everyday materials can be grouped on the basis of their properties. To know how different materials respond to magnets. To know that some materials will dissolve in	To investigate and compare the properties of a broad range of materials. (including relating to magnetism and electricity) To investigate reversible changes. (Including evaporating, filtering,	**Key concept: Chemical/physical changes** Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve reversible/non-reversible

			liquid to form a solution, and describe how to recover a substance from a solution To know that melting and dissolving are different processes. To understand solids, liquids and gases to decide how mixtures might be separated. To know reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials. To understand that dissolving, mixing and changes of state are reversible changes To understand and explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible. To know changes associated with burning and the action of acid on bicarbonate of soda.	sieving, melting and dissolving.) To investigate changes that are difficult to reverse. (e.g. burning, rusting and other reactions; vinegar with bicarbonate of soda) To research how chemists create new materials. (e.g. Spencer Silver, who invented the glue for sticky notes or Ruth Benerito, who invented wrinkle-free cotton) To observe that some conductors will behave differently in electrical circuits. (e.g. produce a brighter bulb in a circuit than others and that some materials will feel hotter than others when a heat source is placed against them) To investigate answers to questions (e.g. 'Which materials would be the most effective for making a warm jacket, for wrapping ice cream to stop it melting, or for making blackout curtains?') To identify and compare materials in order to make a switch in a circuit. To observe and compare the changes that take place in materials (e.g. when burning different materials or baking bread or cakes.) To research and discuss how chemical changes have an impact on our lives (e.g. cooking) To research and discuss the creative use of new materials. (such as polymers, super-sticky and super-thin materials)	change, burning, rusting, new material, chemical **Revisit vocabulary taught in Lower Key Stage 2.**
	Physics	**To understand movement, forces and magnets**	To understand that unsupported objects fall towards the Earth because of the force of gravity. (that acts between the Earth and the falling object) To understand the effects of air resistance, water resistance and friction, that act between moving surfaces. To know that some mechanisms allow a smaller force to have a greater effect. (e.g. including levers, pulleys and gears)	To investigate, using a fair test, falling objects and raise my own questions using the results. (e.g. falling paper cones or cup-cake cases, making a range of parachutes) To observe how different objects fall. (parachutes and sycamore seeds) To investigate resistance in water, (e.g.making and testing boats of different shapes) To research, design and make products that use levers, pulleys, gears	**Key concept:Air/water resistance, gravity ,** Force, Earth, friction, mechanisms, simple machines, levers, pulleys, gears, velocity, thrust, drag **Revisit vocabulary taught in Lower Key Stage 2.**

				and/or springs and explore their effects. To investigate the effects of friction on movement. (e.g. find out how it slows or stops moving objects, by observing the effects of a brake on a bicycle wheel) To investigate the effects of levers, pulleys and simple machines on movement. To research how scientists helped to develop the theory of gravity. (e.g. Galileo Galilei and Isaac Newton)	
		To understand light	To understand that they need light in order to see things and that dark is the absence of light To know that light is reflected from surfaces. To understand and describe that light from the sun can be dangerous and that there are ways to protect their eyes. To understand how shadows are formed and what might cause these to change. To know how the size of shadows change.	To spot patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes. To investigate and measure what happens to shadows when the light source moves or the distance between the light source and the object changes. To investigate that shadows are formed when the light from a light source is blocked by an opaque object To investigate what happens when light reflects. (e.g. off a mirror or other reflective surfaces, including playing mirror game) To use knowledge to answer questions about how light behaves.	**Key concept: Behaviour of light** Straight lines, Light rays, refraction, reflection, scattering, intensity **Revisit vocabulary taught in Lower Key Stage 2.**
		To understand electrical circuits	To know the effect of the number and voltage of cells used in the circuit on the brightness of a lamp or the volume of a buzzer. To understand variations in how components function. (i.e.the brightness of bulbs, the loudness of buzzers and the on/off position of switches) To know and use symbols when representing a simple circuit in a diagram. To know and consider various forms of making electricity.	To identify the effect of changing one component at a time in a circuit. To investigate, design and make a useful circuit. (e.g. a set of traffic lights, a burglar alarm) To design investigations, to answer questions about the effects of different components in a circuit. (e.g., switches, bulbs, buzzers and motors)	**Key concept: Renewable energy** in circuit, circuit diagram, circuit symbol, motor, switch, electrons,, particules, filament, fuse, renewable, solar, current, wave/wind/solar power **Revisit vocabulary taught in Lower Key Stage 2.**

			To know the impact of forms of electricity on the environment.		
		To understand the Earths movement in space	To understand the movement of the Earth, and other planets, relative to the Sun in the solar system. To understand how the geocentric model of the solar system gave way to the heliocentric model by considering the work of scientists. To understand that a moon is a celestial body that orbits a planet (Earth has one moon; Jupiter has four large moons and numerous smaller ones). To understand the movement of the Moon relative to the Earth. To know why some people think that structures such as Stonehenge might have been used as astronomical clocks. To understand the Sun, Earth and Moon as approximately spherical bodies. To understand the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. To know that the Sun is a star at the centre of our solar system and that it has eight planet.	To research the way that ideas about the solar system have developed. To research and compare the time of day at different places on the Earth through internet links and direct communication. To research and create simple models of the solar system. To investigate and construct simple shadow clocks and sundials. (these should be calibrated to show midday and the start and end of the school day)	**Key concept: Solar system** Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune, (Pluto was reclassified as a 'dwarf planet' in 2006) Spherical, rotates, star, orbits, planets, axis, centric, geocentric, heliocentric, time zone Suggested scientists: Ptolemy, Alhazen and Copernicus **Revisit vocabulary taught in Lower Key Stage 2.**