Science Skills, Knowledge & Vocabulary							
	Reception	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**
Observing over time	ELG – The Natural World Explore the natural world around them, making observations and drawing pictures of animals and plants. Understand some important processes and changes in the natural world around them, including the seasons and changes states of matter.	Talk and write about the best ways of observing or measure the change. Create simple charts to show how something changes. Talk to partners about what they think has happened. Begin to think about and talk about connections. Support children to raise questions and suggest what they think will happen. With support plan what to do. (what to observe, how to measure, how often) Experiment with different methods of measuring – non-standard/standard units of measure. Record measurements using	Measure more accurately and record the changes. Present data in a table or bar chart. Think about what factors may have affected what they observed and with support set up a test to investigate some of these factors . Suggest further questions to investigate.	Raise question Make predictions about what will happen. Plan how, what and when to measure. Record observation in appropriate ways. (scale diagrams, bar charts, tables) Describe findings with each other . Give simple explanations linking cause and effect. Evaluate what they do. Develop and use key vocabulary.	Record observations as line graph. Use simple models to demonstrate understanding. (e.g. torch and an object to create shadows)	Suggest how they could observe something over time. Use digital microscope, visualisers data loggers to observe changes over time. Make detailed drawings, create sequences of microscope images, mini videos, time lapse videos and photos, use small squared graph paper to measure area/spread. Draw line graphs. Use secondary sources to find out more. Ask questions about how a topic can be investigated.	Be more systematic and accurate in collection of data. Compare data collected in different conditions e.g. mould growth on different foods in different temps. Research ways of changing the outcome of results .(e.g. slowing something down, eliminating or improving)

		writing, drawings, photos or videos. Begin to relate ideas from observations to other known experiences (e.g. puddles drying up with a floor being washed at home) Talk about whether changes were what they expected and why. Develop and use key vocabulary.				Plan how to carry out an observation safely and record results systematically. Take accurate measurements. Describe what they have observed. Use scientific knowledge to explain what they have observed. Make predictions about what would happen in different conditions. Evaluate how effective their investigation was and how the might improve it. Develop and use Key vocabulary.	

Identifying and classifying	ELG – The Natural World Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.	Ask questions about why things are similar or different. Decide what to observe to identify or sort things. Make comparisons between simple features of objects, materials or living things. Look closely using hand lenses, digital microscopes and taking photos. Record observations in simple worlds, pictures and tables. Sort objects by observable features. Use simple sorting circles and tables. Identify similarities and differences and talk about them. Use simple scientific language to talk about how things are similar or different.	Sort objects by observable and behavioural features. Record sorting using Venn and carol diagrams. Use records to help sort or identify other things. Use secondary sources to find out more about similarities and differences.	Talk about what criteria I will use to sort and classify things. Decide what equipment to use to identify and classify things. Recognise when questions can be answered by sorting and classifying. Carry out simple tests to sort and classify according to properties or behaviour. Use Carrol diagrams, Venn diagrams and more complex tables to sort things. Use simple classification keys and branching databases to identify, sort or classify. Draw simple conclusions about the things that have been sorted and classified.	Ask questions that need more detailed observations. Compared guides and keys with published ones. Try out guides and keys with groups of children. Make simple branching databases and keys for things that have more than two choices. Suggest improvements to the way things sorted and identified. Evaluate which question are most useful when creating a key.	Decide when identifying and classifying will be helpful to answer a question. Decide what equipment, tests and secondary of things. classify information to use to identify. Use a series of tests to sort and classify materials. Use secondary sources to identify and classify things. Make keys and branching databases with four or more items. Use Venn and Carol diagrams with more than two criteria. Use more than one piece of scientific evidence to identify and classify things.	Find creative ways to record their findings. Evaluate the suitability of materials/products/research following sorting and classifying.

				Discuss similarities and differences identified using some scientific language.		Draw valid conclusions when sorting and classifying. Talk about and explain what has been done using scientific knowledge. Evaluate how well keys and branching databases have worked.	
Pattern seeking		Ask questions about why and how things are linked. With support decide what patterns to observe and measure and suggest how to do it. Use non-standard units and simple equipment to record events that might be related. Record in words or pictures, or in simple prepared formats such as tables, tally charts and maps.	Use standard units of measure of whole numbers to measure length/mass/capacity/ Temperature. Use simple equipment (rulers/scales/thermometers/ and measuring vessels) to record events that might be related. Compare what has been found with what had been predicted. Observe more systematically, making more specific	Talk about where patterns might be found and recognise when questions can be investigated by pattern seeking. Decide on which sets of data tom collect, what observations to make and what equipment to use. Use a range of equipment to collect data using standard measures. Make records using tables and bar charts.	Make records using tables, bar charts, line and time graphs. Begin to use and interpret data collected through data loggers. Begin to identify data that doesn't fit the trend and think about why this might be. Think about when the pattern changes and begin to explain why e.g. height and weight changes. Identify scientific reasons for some of the pattern that they find.	Recognise when variable cannot be controlled and decide when pattern seeking will help to answer a question. Decide how detailed data needs to be, and which equipment to use, to make measurements as accurate as possible. Use equipment accurately to collect observations.	Present data in scatter graphs and frequency charts. Be more systematic and precise in how data is collected. Distinguish between opinion and evidence. Recognise that data sets can be connected without it being a causal relationship. Recognise anomalies in their

		Identify simple patterns and talk about them. Make links between two sets of observations. Begin to use scientific language to talk about patterns. Discuss whether the pattern was what was expected.	observations and keeping pictorial records. With support, collect numerical data about numbers of things found and compare these. (pictograms and tally charts)	Draw simple conclusions about simple patterns between two sets of observations. Talk about patterns using scientific language. Suggest improvements to methods used to look for patterns. Choose how to present data. Use scientific and mathematical conventions. (e.g. compare hand size by area in cm2)		Record data appropriately and accurately. Present day in a variety of different formats. Recognise patterns in results Recognise the effect of sample size on reliability. Draw valid conclusions from data about patterns and recognise their limitations. Recognise the significance of relationships between sets of data. Talk about and explain cause and effect patterns using scientific knowledge and understanding. Evaluate their own success in looking for patterns.	data and begin to explain them. Evaluate conclusions in terms of the quality and validity of the data collected.

Research		Ask questions about how things are and the way they work. Ask questions to find out what people do and how things work. Help make suggestions about how to find things out. Use simple books and electronic media to find things out. Record in words and pictures what has been found out. Begin to use scientific language tom talk about what has been found out. Talk about whether the information source was useful. Give an opinion about some things found out.	Select information from a wide range of sources, including suitable internet Sites. Use a graphic organiser to show the differences. (e.g. the different ingredients of chocolate and the effect if one ingredient is missing) Think about environmental impact.	Talk about how things are and the way they work and recognise when questions can be answered by research using secondary sources. Use information sources to find the information needed. Use someone else's data Record what has been found out in my own words. Present information in different ways. Draw conclusions from what has been found out from different sources. Talk about what the information and data means using some scientific language. Suggest ways to improve how to find out and use information.	Ask questions about how the data they are using was collected. Compare what people knew about a topic. (e.g. now with 500 years ago) Find more creative ways to share their findings.(e.g. blog/presentation) Find out about and discuss how scientific and technological developments help us to learn more.	Decide when research using secondary sources will help to answer questions. Decide which sources of information might answer questions. Use relevant information and data from a range of secondary sources. Recognise how data has been obtained. Start to notice when information and data is biased or based on opinions rather than facts. Present findings in suitable formats.	Ask questions that require more detailed information. Explain why some questions don't have definitive answers. Think about how the data they are using were collected and how valid they are. Describe technological and scientific developments in a specific area. Think about ethical and moral issues. Identify reasons why different sources my provide conflicting data.

Fair testing		Ask why and how questions. Make comparisons about how things behave. With support, notice links between cause and effect. With support, identify simple variables to change and measure. Plan simple comparative tests with support. Can use non-standard units and simple equipment to record data. Record in words or pictures, or in simple prepared formats such as tables and tally charts. Talk about the data that has been collected. Use comparative data to rank materials or objects.	Suggest more questions that they could investigate. Test different materials to find out which is best at stopping the sound. Make their own suggestions about how to make sure that tests are fair.	Talk about links between cause and effect and with help pose a fair test question. Help to plan a comparative or fair test. Decide what data to collect. Decide what equipment to use and how to make observations. Use a range of equipment to collect data using standard measures. Make records using tables and bar charts. Draw simple conclusions from comparative and fair tests. Talk about and explain simple causal relationships using some scientific language.	Begin to use and interpret data collected through data loggers. Make their own plans and carry out a series of fair tests on different aspects. Make own decisions about how to present data. Identify new questions to be answered. Think about issues relating to science and advertising, such as whether all claims are testable or justified.	Recognise when variables need to be controlled and decide when a comparative or fair test if the best way to answer a question. Plan a comparative or fair test, selecting variables to measure, change and keep the same. Decide what equipment to use to make measurements as accurate as possible. Use equipment accurately to collect observations. Record data appropriately and accurately. Present data in line graphs Identify casual relationships. Draw valid conclusions	Be more systematic and precise in how they collect data. Take account of a greater range of variables, recognising which are most significant. Write an article about a topic. Recognise anomalies or inconsistencies in their data and try to explain them.

		Use simple scientific language to, describe simple causal relationships. With support, identify if the test was fair. Decide if the relationship was what was expected.		Suggest ways that can improve fair tests.		based on the data. Recognise the significance of the results of comparative and fair tests. Talk about and explain causal relationships using scientific knowledge and understanding. Evaluate the effectiveness of my comparative and fair testing, recognising variables that were difficult to control.	
Plants	ELG – The Natural World Explore the natural world around them, making observations and drawing pictures of animals and plants. Know some similarities and differences between the	Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. Identify and describe the basic structure of a variety of common flowering plants, including trees. ***Vocabulary: leaf, flower, petal, fruit,***	Observe and describe how seeds and bulbs grow into mature plants. Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy ***Vocabulary: seed, bulb, germinate, seeding, bud,***	Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they			

	natural world around them and contrasting environments, drawing on their experiences and what has been read in class. Understand some important processes and changes in the natural world around them, including the seasons and changes states of matter.	***root, seed, trunk, branch, stem, bark***	***flower, fruit, berry, root***	vary from plant to plant. Investigate the way in which water is transported within plants. Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. ***Vocabulary: roots, stem/trunk, leaves, photosynthesis, pollen, pollination, seed formation, seed dispersal, germination***			
Living things and their habitats	ELG – The Natural World Explore the natural world around them, making observations and drawing pictures of animals and plants. Know some similarities and differences between the natural world		Explore and compare the differences between things that are living, dead, and things that have never been alive. Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and		Recognise that living things can be grouped in a variety of ways. Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. Recognise that environments can change and that this can sometimes pose	Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. Describe the life process of reproduction in some plants and animals. ***Vocabulary: life cycle, reproduction, sexual***	Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals.

	around them and contrasting environments, drawing on their experiences and what has been read in class. Understand some important processes and changes in the natural world around them, including the seasons and changes states of matter.		plants, and how they depend on each other. Identify and name a variety of plants and animals in their habitats, including microhabitats. Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food. ***Vocabulary: living, dead, never been alive, habitat, micro-habitat, food chain***		dangers to living things. ***Vocabulary: classification, classification key, environment, habitat, migrate, hibernate, vertebrates, invertebrates***	***reproduction, asexual reproduction, fertilise, metamorphosis, runner, bulb, cutting, tuber***	Give reasons for classifying plants and animals based on specific characteristics. ***Vocabulary: vertebrate, fish, amphibian, reptile, bird, mammal, invertebrate, plants***
Animals including humans	ELG – The Natural World Explore the natural world around them, making observations and drawing pictures of animals and plants. Know some similarities and differences	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.	Notice that animals, including humans, have offspring which grow into adults. Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). Describe the importance for humans of exercise,	Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat. Identify that humans and some other animals have skeletons and	Describe the simple functions of the basic parts of the digestive system in humans. Identify the different types of teeth in humans and their simple functions. Construct and interpret a variety of food chains, identifying producers, predators and prey.	Describe the changes as humans develop to old age. ***Vocabulary: puberty, sexual reproduction, menstruation, sperm, egg, foetus, gestation, life expectancy***	Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. Recognise the impact of diet, exercise, drugs

	between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.	Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. ***Vocabulary: head, eyes, body, mouth, leg, wing, fin, feathers, beak, hooves, body, ears, teeth, tail, teeth, tail, claw, scales, fur, paws, hair***	eating the right amounts of different types of food, and hygiene. ***Vocabulary: offspring, reproduction, growth, exercise, breathing, hygiene, germs, disease***	muscles for support, protection and movement. ***Vocabulary: nutrition, nutrients, carbohydrates, proteins, vitamins and minerals, fibre, skeleton, bones, muscles, joints***	***Vocabulary: digestive system, digestion, herbivore, carnivore, omnivore, producer, consumer, predator, prey, food chain***		and lifestyle on the way their bodies function. Describe the ways in which nutrients and water are transported within animals, including humans. ***Vocabulary: heart, pulse, blood, blood vessels, lungs, circulatory system, diet, exercise, drugs, lifestyle***
Evolution and inheritance							Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. Recognise that living things produce offspring of the same kind,

							but normally offspring vary and are not identical to their parents. Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. ***Vocabulary: evolution, offspring, inherited, characterised, variation, adapted, environment, species, fossil***
Seasonal changes	ELG – The Natural World Understand some important processes and changes in the natural world around them, including the seasons and changes states of matter.	Observe changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies ***Vocabulary: season, Autumn, Winter, Spring, Summer, weather, sunrise, sunset***					

Materials		Distinguish between an object and the material from which it is made. Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. Describe the simple physical properties of a variety of everyday materials. Compare and group together a variety of everyday materials on the basis of their simple physical properties. ***Vocabulary: hard, stretchy, bendy, waterproof, breaks, rough, shiny, see through, soft, stiff, floppy, absorbent, tears, smooth, dull, not see through***	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. ***Vocabulary: transparent, translucent, opaque, flexible, rigid, reflective, non-reflective, absorbent***		Compare and group materials together, according to whether they are solids, liquids or gases. Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C). Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. ***Vocabulary: change of state, melting, freezing, melting point, boiling point, evaporation, condensation, water cycle, temperature***	Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. Give reasons, based on evidence from comparative and fair tests, for the	

						particular uses of everyday materials, including metals, wood and plastic. Demonstrate that dissolving, mixing and changes of state are reversible changes. Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda. ***Vocabulary: thermal insulator, thermal conductor, electrical insulator, electrical conductor, dissolve, solution, soluble, insoluble, sieve,***	

						filter, evaporation, reversible change, non-reversible change	
Rocks				Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. Describe in simple terms how fossils are formed when things that have lived are trapped within rock. Recognise that soils are made from rocks and organic matter. ***Vocabulary: rock, fossil, soil***			
Light				Recognise that they need light in order to see things and that dark is the absence of light. Notice that light is reflected from surfaces.			Recognise that light appears to travel in straight lines. Use the idea that light travels in straight lines to explain that objects are seen because they

				Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. Recognise that shadows are formed when the light from a light source is blocked by an opaque object. Find patterns in the way that the size of shadows change. ***Vocabulary: light, dark, light source, transparent, translucent, opaque, shadow, reflect, mirror***			give out or reflect light into the eye. Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. ***Vocabulary: light source, straight lines, light ray, reflect, shadow***
Forces				Compare how things move on different surfaces. Notice that some forces need contact between two objects, but magnetic forces can act at a distance. Observe how magnets attract or		Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. Identify the effects of air resistance, water resistance	

				repel each other and attract some materials and not others. Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. Describe magnets as having two poles. Predict whether two magnets will attract or repel each other, depending on which poles are facing. ***Vocabulary: force, magnetic force, magnet, attract, repel, poles, contact force, non-contact force***		and friction that act between moving surfaces. Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. ***Vocabulary: force, gravity, forece meter, Newton (N), air resistance, water resistance, friction, mechanisms, simple machines***	
Sound					Identify how sounds are made, associating some of them with something vibrating. Recognise that vibrations from sounds travel through a medium to the ear.		

					Find patterns between the pitch of a sound and features of the object that produced it. Find patterns between the volume of a sound and the strength of the vibrations that produced it. Recognise that sounds get fainter as the distance from the sound so. ***Vocabulary: sound, sound source, vibrations, pitch, volume, sound insulation***		
Electricity					Identify common appliances that run on electricity. Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery.		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

					Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. Recognise some common conductors and insulators, and associate metals with being good conductors. ***Vocabulary: electricity, electrical appliance, mains, electrical circuit, cell and battery, electrical component, switch, conductor, insulator***		buzzers and the on/off position of switches. Use recognised symbols when representing a simple circuit in a diagram. ***Vocabulary: circuit, circuit symbol, circuit diagram, cell, battery, switch, voltage***
Earth and space						Describe the movement of the Earth, and other planets, relative to the Sun in the solar system. Describe the movement of the Moon relative to the Earth. Describe the Sun, Earth and Moon	

						as approximately spherical bodies. Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. ***Vocabulary: Earth, Sun, Moon, planets, solar system, star, rotate, orbit***	