

Aspect	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<u>Skills</u> Survival	Describe some ways that plants or animals should be cared for in order for them to survive.	Describe how to care for plants and animals, including pets.	Explain how animals, including humans, need water, food, air and shelter to survive	Describe the requirements of plants for life and growth (air, light, water, nutrients and room to grow) and how they vary from plant to plant.	Explain how adaptations help living things to survive in their habitat.	Describe the life process of reproduction in some plants and animals.	Identify how animals and plants are adapted to suit their environment, such as giraffes having long necks for feeding, and that adaptations may lead to evolution.
<u>Knowledge</u> Survival	In winter the days are short and the nights are cold. Some birds need us to feed them during winter to help them survive. Plants need water, sunlight and air to grow and survive. Gardeners use compost to help plants grow. Plants need water, sunlight and air to survive. Many plants grow from seeds. Plants need water, sunlight, air and warmth to grow. Pets need food, water, sleep, exercise and play to keep them happy and healthy.	Living things need to be cared for in order for them to survive. Living things need water, food, warmth and shelter. An animal's habitat must provide water, food, air and shelter for the animal to survive. Animals eat food that is found in their habitat. Herbivores eat plants. Omnivores eat plants and animals (meat). Carnivores eat other animals (meat).		Plants are living things because they grow, take in water and nutrients and reproduce. Plants need air, light, water, nutrients and room to grow, in order to survive. An adaptation helps an animal or plant survive in its habitat. If living things are unable to adapt to changes within their habitat, they are at risk of becoming extinct.		Sexual reproduction is the process of producing offspring and is essential for the continued survival of a species. Asexual reproduction involves one parent and produces offspring that is identical to the parent. An adaptation is a physical or behavioural trait that allows a living thing to survive and fill an ecological niche. Natural selection is also known as 'survival of the fittest' because favourable traits help an organism survive and pass on their genes through reproduction. The three different types of plant adaptations are structural, behavioural and chemical. Structural adaptations include modified leaves, roots and trunks. Behavioural adaptations include movement towards the Sun and regulated growth. Chemical adaptations include the presence of stings and poisons.	
<u>Skills</u> Living things	Explore the natural world around them and give simple descriptions, following observation, of changes.	Describe, following observation, how plants and animals change over time.	Observe and describe how seeds and bulbs change over time as they grow into mature plants.	Draw and label the life cycle of a flowering plant.	Explain how unfamiliar habitats, such as a mountain or ocean, can change over time and what influences these changes.	Describe the changes as humans develop from birth to old age.	Explain that living things have changed over time, using specific examples and evidence.
<u>Knowledge</u> Living things	Some plants and trees change with the seasons. In autumn, the weather starts to turn colder and some leaves change colour and fall from the trees. Living things change over time. In autumn some leaves change colour and fall from the trees. Animals live in different habitats. Animals such as rabbits, badgers and foxes live in a woodland habitat. Nocturnal animals including owls, foxes and bats are awake during the night and asleep during the day. Changes happen to animals across the four seasons. Changes happen to plants across the four seasons. Changes happen to plants as they grow	Deciduous trees change across the four seasons. Changes happen to flowers over time. A seed is a small object made by a plant that can grow into a new plant. Seeds need water and warmth to start growing (germinate). Seeds also form inside cones. As the plant grows bigger, it develops leaves and flowers. The flowers of plants produce seeds. The flowers on some plants develop into fruit that contains seeds. A female butterfly lays eggs. Caterpillars hatch from a butterfly's eggs. Caterpillars grow, then form a chrysalis or cocoon. A butterfly emerges from a chrysalis. Frogs lay frogspawn in ponds. Tadpoles hatch out of the frogspawn and grow into frogs.		The stages of a plant's life cycle include: germination, flower production, pollination, fertilisation, seed formation and seed dispersal. Pollination is the process where pollen is transferred from the male stamen to the female carpel of another flower of the same type. Seeds can be dispersed by wind, animals, explosion and water. Habitats change over time, either due to natural or human influences. All living things depend on the biotic and abiotic features of their ecosystems to survive; therefore, any change to one part will affect all the other parts.		The human gestation period is around 40 weeks. During this time, the organs, limbs and senses develop, and the foetus grows until it is ready to be born. Humans go through characteristic stages as they develop towards old age. Puberty is the transition between childhood and adulthood. As humans age, many of the body's systems gradually decline, leading to the changes seen in older people. The gestation period is the time between conception and birth. In general mammals with a smaller mass have a shorter gestation period than mammals with a larger mass. Humans are mammals and have a mammalian life cycle. The theory of evolution was developed in the 19th century by the naturalists Charles Darwin and Alfred Russel Wallace. The theory states that: all life on Earth has evolved from simple life forms to more complex ones over time; all life on Earth has common ancestors and is therefore related, and; living things with characteristics most suited to their environment are more likely to survive and reproduce. The fossil record and the DNA of living and extinct things provide evidence of evolution.	

<u>Skills</u> Human Body	Draw pictures of the human body and name some of the different body parts.	Draw and label the main parts of the human body and say which body part is associated with which sense. Explore the five senses and the body parts associated with them.	Describe the stages of human development (baby, toddler, child, teenager, adult and elderly).	Describe how humans need the skeleton and muscles for support, protection and movement.	Describe the purpose of the digestive system, its main parts and each of their functions.	Describe the process of human reproduction.	Name and describe the purpose of the circulatory system and the functions of the heart, blood vessels and blood.
<u>Knowledge</u> Human Body	The basic body parts are the head, arms, legs, nose, eyes, ears, mouth, hands and feet. Different body parts are used for different things, such as the eyes are used to see.	The basic body parts are the head, arms, legs, nose, eyes, ears, mouth, hands and feet. Humans grow from baby to toddler to child to teenager to adult to elderly.	Humans have a skeleton and muscles for movement, support and protecting organs. Muscles are soft tissue made up of many stretchy fibres. Muscles allow us to move, breathe and digest food. The three main types of muscle in the human body are skeletal, cardiac and smooth. A joint is where two or more bones meet and connect. Parts of the human body can bend easily because the skeleton has lots of small bones and joints. The digestive system is responsible for digesting food and absorbing nutrients and water. The mouth, oesophagus, small intestine and large intestine are organs of the digestive system. A baby grows 20 primary teeth that start to fall out when a child is six years old. They are replaced by 32 adult teeth. The four different types of teeth are incisors, canines, premolars and molars. Incisors have sharp, straight edges for slicing and cutting food. Canines are pointed for gripping and tearing chewy food such as meat. Pre-molars and molars are wide and have cusps, for crushing and grinding up food so it is small enough to swallow.			Humans reproduce sexually when a female egg is fertilised by a male sperm producing offspring that are different from the parents. The heart, blood and blood vessels make up the circulatory system. The circulatory system moves blood around the body. Human growth charts are line graphs that show the predicted growth of juveniles and adolescents up to 18 The heart is a muscular organ that pumps blood around the body through the blood vessels. Heart rate increases during exercise because the body requires more oxygen to meet its needs. Blood vessels are tubes inside the body. The three types of blood vessels are arteries, capillaries and veins. Arteries carry blood from the heart to the rest of the body. Capillaries connect arteries to veins. They allow oxygen and other nutrients to pass from the blood to the tissues, and carbon dioxide and other waste materials to pass from the tissues to the blood. Veins carry blood from around the body back to the heart. Blood is a substance that carries oxygen, other nutrients and hormones around the body. It also carries carbon dioxide and other waste products so they can be excreted. Blood is made up of plasma, platelets, red blood cells and white blood cells. Plasma is a yellowish liquid, mainly water. It carries red blood cells, white blood cells and platelets around the body. Red blood cells carry oxygen and carbon dioxide around the body. White blood cells fight infection and other diseases. Platelets are small cell fragments that clump together to stop bleeding from a cut in a blood vessel.	
<u>Skills</u> Healthy Lifestyle	Wash and dry hands regularly and say why this is important.	Explain why hand washing and cleanliness are important.	Describe the importance of a healthy lifestyle, including exercise, a balanced diet, good quality sleep and personal hygiene.			Explain the importance and characteristics of a healthy, balanced diet.	
<u>Knowledge</u> Healthy Lifestyle	It is important to wash and dry our hands after using the toilet and before eating to stop the spread of harmful germs. It is important to wash our hands to stop the spread of germs.	Hand washing and good hygiene prevent the spread of germs. A healthy lifestyle includes exercise, a balanced diet, good quality sleep and personal hygiene. Risks associated with an unhealthy lifestyle include illness, obesity, tooth decay and mental health problems. Germs are microorganisms that can cause illness in humans. Germs get into the body through the eyes, nose or mouth.	Humans get nutrition from what they eat. It is important to have a balanced diet made up of the main food groups, including: proteins, carbohydrates, fruit and vegetables, dairy products and alternatives, and fats and spreads. Humans stay hydrated by drinking water. Regular teeth brushing, limiting sugary foods and visiting the dentist are important for good oral hygiene.			Good personal hygiene (washing, wearing clean clothes and brushing teeth) can prevent disease or illness. Exercise benefits your heart by lowering blood pressure, reducing weight, strengthening muscles and lowering stress. The Eatwell guide presents the foods and drinks that contribute to a healthy balanced diet. The five food groups are: fruit and vegetables, carbohydrates, dairy and alternatives, proteins and oils and spreads. Some foods, especially highly processed ones, are high in sugar, salt and fat are not necessary for a healthy, balanced diet.	

		Washing hands with soap and clean running water helps humans avoid getting ill and spreading germs to others.				Eating more than the recommended daily amounts of saturated fat, sugar and salt can have a harmful effect on the circulatory system, such as causing high blood pressure and an increased risk of heart disease. Nutrition labels on pre-packaged food help us to know what is in the food we eat. Nutrition labels are often displayed using a traffic light system, so consumers can easily see whether the food contains high (red), medium (orange) or low (green) amounts of sugar, salt and saturated fat. Smoking, drugs and alcohol can have a negative impact on the circulatory system. Smoking can result in cancer and heart disease. Alcohol can cause high blood pressure and increased stroke risk. Drugs can cause collapsed veins and cardiac arrest.	
Skills Nutrition	Match animals to the foods that they eat.	Group and sort a variety of common animals based on the foods they eat.	Interpret and construct simple food chains to describe how living things depend on each other as a source of food.	Compare and contrast the diets of different animals.	Construct and interpret a variety of food chains and webs to show interdependence and how energy is passed on over time.	Describe, using their knowledge of food chains and webs, what could happen if a habitat had a living thing removed or introduced.	Explain that the circulatory system in animals transports oxygen, water and nutrients around the body.
Knowledge Nutrition	Animals eat different kinds of food, including other animals, plants or both animals and plants.	Carnivores eat other animals (meat), herbivores eat plants and omnivores eat other animals and plants. Food chains show how living things depend on one another for food. Plants always start a food chain because they are producers that make their own food using sunlight. Prey animals have different ways to avoid capture by predators. Plants have adaptations that protect them from being eaten by animals.		Nutrition is the life process of making or finding food to eat. Humans must eat food and drink water to gain the nutrients they need to survive. Humans are omnivores, so they can eat both plant parts and animals. In the wild, animals' diets change over the year as the seasons change due to certain foods becoming available or unavailable. Carnivores only eat meat. Herbivores only eat plants. Omnivores eat meat and plants. All the different food chains in a specific ecosystem can be linked together. These connected food chains are called a food web. Food chains start with a plant (producer), show what animals eat within a habitat and how energy is passed on over time. A producer is a living thing that makes its own food for energy. Almost all producers are plants. Producers make their own food through the process of photosynthesis. Grass and seaweed are examples of producers. A consumer is a living thing that feeds on other living things. Most consumers are animals. Wolves and penguins are examples of consumers. A predator is a consumer that hunts, kills and eats other animals for food. An animal is called prey if it is killed by a predator for food. An ecosystem is a community of living organisms and their environments that are interdependent. Ecosystems have biotic, or living, features including plants, animals and microorganisms. They also have abiotic, or		Population changes in a habitat can have significant consequences for food chains and webs. The human body has different systems that support the seven life processes. The skeletal system supports movement, gives the body shape and protects the organs. The skeletal muscular system supports movement. The endocrine system supports growth. The nervous system supports sensation and movement as it controls almost everything the body does. The digestive system supports nutrition by breaking down food so the body can absorb nutrients. The excretory system supports excretion (getting rid of waste). The reproductive system supports reproduction. The respiratory system supports respiration by taking in oxygen when we breathe in and removing carbon dioxide when we breathe out. The circulatory system supports the transport of oxygen, water and nutrients around the body.	

				non-living, features including sunlight, water, air, soil and temperature.			
<u>Skills</u> Identification and classification – plants and animals	Begin to name and group plants and trees according to their observable features. Match animals to their young.	Identify, compare, group and sort a variety of common wild and garden plants, including deciduous and evergreen trees, based on observable features. Identify, compare, group and sort a variety of common animals, including fish, amphibians, reptiles, birds, invertebrates and mammals, based on observable features.	Identify and name a variety of plants and animals in a range of habitats and microhabitats. Revise the Identification of a variety of common animals, including fish, amphibians, reptiles, birds, invertebrates and mammals, based on observable features. Describe the basic life cycles of some familiar animals (egg, caterpillar, pupa, butterfly; egg, chick, chicken; spawn, tadpole, froglet, frog).	Describe how animals are grouped and what they need to survive. Identify and group animals that have no skeleton, an internal skeleton (endoskeleton) and an external skeleton (exoskeleton).	Compare, sort and group living things from a range of environments, in a variety of ways, based on observable features and behaviour.	Group and sort plants by how they reproduce.	Use and construct classification systems to identify animals and plants from a range of habitats. Classify living things, including microorganisms, animals and plants, into groups according to common observable characteristics and based on similarities and differences.
<u>Knowledge</u> Identification and classification – plants and animals	Parts of a plant include the roots, stem, leaves, flowers and petals. Animal babies are known by different names than adult animals, such as cow and calf or sheep and lamb. Not all animal babies have the same features as their parents when they are born.	Plants are living things. Trees are large, woody plants and are either evergreen or deciduous. Trees that lose their leaves in the autumn are called deciduous trees. Plants are important because they provide food, shelter and materials for animals, including humans. The leaves of most deciduous trees are wide and flat. The leaves of most evergreen trees are thin and pointed. Humans are living things. They belong to a group of animals called mammals. Humans normally have the same body parts. Humans look different from each other. Animals are living things. Fish, amphibians, reptiles, birds, invertebrates and mammals are groups of animals. A habitat is a place where plants and animals live. A microhabitat is a very small habitat. Invertebrates are animals without a backbone.		Scientists classify living things according to shared characteristics. A classification key is a set of questions that helps us identify a living thing or decide which group it belongs to. The animal kingdom is divided into vertebrates and invertebrates. A vertebrate is an animal with a backbone. An invertebrate is an animal without a backbone. Invertebrates usually have soft bodies or a hard outer shell or covering called an exoskeleton. The plant kingdom is divided into vascular and non-vascular plants. Vascular plants have tiny tubes or vessels that carry water, nutrients and provide structure. Plants with seeds and plants with spores are the two main types of vascular plants. Flowering and cone-bearing plants are the two groups of plants with seeds. Vertebrates are covered with skin, feathers, scales, fur or hair. They give birth to live young or lay eggs. Vertebrates can be cold blooded or warm blooded.		Classification keys help us identify living things based on their physical characteristics. The first and widest level in the biological classification system is called a kingdom, the second a phylum, then class, order, family, genus and species. There are five kingdoms: animals, plants, fungi, protists and monerans. Members of each kingdom have features in common.	

		Invertebrates include worms, molluscs, crustaceans, insects, arachnids and myriapods. Animals are born or hatch from eggs. The young grow and change until they become adults that can reproduce. A life cycle can be drawn as a circular diagram.					
Skills Habitats	Observe and describe living things and their habitats within the local environment.	Observe the local environment throughout the year and ask and answer questions about living things and seasonal change.	Describe a range of local habitats and habitats beyond their locality (beaches, rainforests, deserts, oceans and mountains) and what all habitats provide for the things that live there.	Describe how environments can change due to natural influences and how living things need to be able to adapt to these changes.	Describe how environments can change due to human and natural influences and the impact this can have on living things.	Research and describe different farming practices in the UK and how these can have positive and negative effects on natural habitats.	Research unfamiliar animals and plants from a range of habitats, deciding upon and explaining where they belong in the classification system.
Knowledge Habitats	Living things live in different habitats. Gardens are habitats for many plants, trees and animals. Different animals live in different places. A farm is an area of land and its buildings used for growing crops and rearing animals. Animals such as snails, spiders and insects live in gardens, fields, parks and woodlands. Animals live in different habitats. Rock pools are habitats for many animals, such as starfish, crabs, anemones, mussels, barnacles and periwinkles. Animals live in different habitats. The ocean is the habitat for many animals, such as fish, dolphins, whales, sharks and turtles.	The local environment is a habitat for living things and can change during the seasons. A habitat is a place where plants and animals live. Local habitats include parks, woodland and gardens. Habitats beyond the locality include beaches, rainforests, deserts, oceans and mountains. A habitat provides food, water, shelter and space. Humans can damage or destroy habitats. Their actions can harm and even kill living things. Humans can help habitats. They can create new habitats, make habitats safer or provide food and shelter for living things.		Environments are constantly changing due to natural influences, such as seasons, extreme weather, population changes and availability of food. Living things must adapt to these changes in order to survive. Humans can affect habitats in negative or positive ways.		Arable (growing crops), pastoral (raising livestock), mixed (arable and pastoral) are the three main types of farming in the UK. Intensive farming in the past has resulted in the loss of habitats. Living things are classified into groups, according to common observable characteristics and based on similarities and differences. Microorganisms are microscopic living things found in the fungus, protista and monera kingdoms. Microorganisms can be helpful or harmful to other living things. Viruses are not included in the kingdoms as they are not living and need a host to survive and reproduce.	
Skills Plants, Flower Parts and functions	Name and describe basic features of plants and trees. Identify common features for different groups of animals, including wild and domestic animals.	Label and describe the basic structure of a variety of common plants. Label and describe the basic structures of a variety of common animals, including fish, amphibians, reptiles, birds and mammals.	Describe how plants need water, light and a suitable temperature to grow and stay healthy.	Name and describe the functions of the different parts of flowering plants (roots, stem, leaves and flowers). Investigate how water is transported within plants.	Identify the four different types of teeth in humans and other animals, and describe their functions.	Label and draw the parts of a flower involved in sexual reproduction in plants (stamen, filament, anther, pollen, carpel, stigma, style, ovary, ovule and sepal).	Identify that living things produce offspring of the same kind, although the offspring are not identical to either parent. Describe how animals and plants can be bred to produce offspring with specific and desired characteristics (selective breeding).

Knowledge Plants, Flower Parts and functions	A sunflower is a type of plant that usually has a very tall stem and a yellow flower with lots of long, thin, petals. Living things are different in different places around the world.	The basic plant parts include root, stem, leaf, flower, petal and fruit. Plants grow from seeds or bulbs. Different animal groups have some common body parts. Plants need water, light and a suitable temperature to grow and stay healthy. Many plants grow from seeds or bulbs. Plants have roots, stems, leaves, flowers and fruit. A bulb contains a tiny plant and all the food needed to grow.		Many plants grow from seeds or bulbs. Plants have roots, stems, leaves, flowers and fruit. Roots anchor the plant in the ground and transport water and minerals from the ground to the plant. The stem (or trunk) support the plant above the ground. Leaves collect energy from the Sun and make food for the plant. Flowers make seeds to produce new plants. Parts of a flower include the sepal, petal, stamen and carpel. Water is transported in plants from the roots, through the stem to the leaves.		Parts of a flower include the stamen, filament, anther, pollen, carpel, stigma, style, ovary, ovule and sepal. Inheritance is when living things pass on characteristics following sexual reproduction, such as height, skin colour and eye colour. Variation is the natural differences in characteristics between individuals of the same species. Continuous variation contains a range of values, such as the height or mass of different individuals of the same species. Discontinuous variation has a certain number of outcomes, such as eye colour and blood groups. Plants can be bred to produce offspring with specific and desired characteristics. This is called selective breeding.	
VOCABULARY (for all of above)	Leaves, flowers, water, food, air summer, autumn, winter, spring Daytime, nighttime, grow	(blossom), petals, fruit, roots, bulb, seed, trunk, branches, stem. Offspring, survival, Egg, caterpillar, pupa, butterfly Life cycle fish, amphibians, reptiles, bird and mammals carnivores, herbivores and omnivores Water, light, suitable temperature Germinate, growth, healthy. Leaves, flowers (blossom), fruit, roots, bulb, seed, trunk, branches, stem. Microhabitat. Living, dead, never alive. Food chain, food, shelter. Season, deciduous, evergreen, hibernate, migrate, hatch, mature		Nutrition, nutrients, carbohydrates, protein, fats, vitamins, minerals Skeleton, endoskeleton, exoskeleton, joint, muscle Digestive system, digestion, oesophagus, stomach, and small and large intestine. Canines, incisors, molars. identify, classification key. Environment, classify, Vertebrate animals – (mammals, reptiles, amphibians, birds, fish. These words are covered in year 1) Invertebrate animals – snails, slugs, worms, spiders, insects. Flowering and non-flowering plants – ferns, grasses, mosses structure and function pollination, seed formation, seed, dispersal air, light, water, soil, nutrients, grow, varying needs dispersal, life cycle		Life cycles, mammal, amphibian, insect, bird, life processes, reproduction, gestation metamorphosis, Birth, growth, puberty, reproduction Embryo, juvenile, adolescent, adult Gestation, mass Classification key/classify. Carl Linnaeus. Kingdom, phylum, class, order, family, genus and species The circulatory system supports the transport of oxygen, water and nutrients around the body. heart, blood vessels, blood, Heart rate, pulse, lifestyle, drugs, nutrients, balanced diet Evolution, inheritance, offspring, variation, adapted traits	
Skills Earth and Space	Describe simply how weather changes as the seasons change.	Observe and describe different types of weather.	Describe features of Earth using words and pictures.	Investigate soils from the local environment, making comparisons and identifying features.	Describe the water cycle using words or diagrams and explain the part played by evaporation and condensation.	Describe or model the movement of the planets in our Solar System, including Earth, relative to the Sun. Describe or model the movement of the Moon relative to Earth.	Identify that light travels in straight lines. Explain that, due to how light travels, we can see things because they give out or reflect light into the eye.
Knowledge Earth and Space	Winter is a season, it comes after Autumn. The weather is colder in winter with more snow, hail and rain. Spring is a season. It comes after Winter and before Summer. Spring weather is changeable. It can be warm, cold, sunny, rainy and even snowy. The weather and local environment changes with the seasons. Spring weather is changeable. It can be warm, cold, sunny, rainy and even snowy.	Wind strength is measured by the Beaufort Scale. Different types of weather include sunshine, rain, hail, wind, snow, fog, lightning, storm and cloud. The weather can change daily and some weather types are more common in certain seasons, such as snow in winter. The Earth is spherical and is covered in water and land. When it is daytime in one location, it is night time on the other side of the world.		Soils are made from tiny pieces of eroded rock, air and organic matter. Soil is one of the world's most important natural resources supporting a wide range of food chains. Soil holds water and nutrients and provides anchorage for roots.		The Solar System is made up of the Sun and everything that orbits around it. The Sun is a huge, hot ball of gas and is the only source of heat and light in the Solar System. The Sun's force of gravity, created by its huge mass, keeps the planets in orbit. The eight planets in our Solar System are Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune. The tilt of the Earth's axis as it orbits the Sun changes the length of daytime and night time and creates different seasons. When the Northern or Southern Hemisphere tilts away from the Sun, it is winter. It gets less direct sunlight, the weather is colder, the daytime is shorter and the night time is longer. When the Northern or Southern Hemisphere tilts towards the Sun, it is summer. It gets plenty of direct sunlight, the weather is warmer, the daytime is longer and the night time is shorter. When it is winter in the Northern Hemisphere it summer in the Southern Hemisphere. Earth orbits around the Sun. The length of time it takes for Earth to complete a full orbit is 365.25 days, one year. The Earth completes one rotation on its axis in 24 hours, one day.	

						The Moon is Earth’s only natural satellite. The Moon is about 385,000km from the Earth. The Moon is not a natural light source. We can only see it because it reflects the Sun’s light. The Moon orbits the Earth once every 27.3 days and also rotates on its axis once every 27.3 days. A solar eclipse happens a few times a year when the Moon passes directly between the Earth and the Sun, blocking our view of the Sun and casting a shadow on the Earth. A lunar eclipse happens a few times a year when the Earth is in line between the Moon and the Sun, casting a shadow on the Moon.	
<u>Skills</u> Phenomena	Name and describe natural phenomena, such as the size of shadows, the colours of a rainbow, the speed of clouds moving across the sky and the strength of a wave.	Explain in simple terms how shadows are formed.	Explain in simple terms how sounds are made.	Describe the differences between dark and light and how we need light to be able to see. Explain, using words or diagrams, how shadows are formed when a light source is blocked by an opaque object.	Explain how sounds are made and heard using diagrams, models, written methods or verbally.	Describe the Sun, Earth and Moon as approximately spherical bodies and use this knowledge to understand the phases of the Moon and eclipses.	Describe, using scientific language, phenomena associated with refraction of light. Revise the understanding of light, reflection and daylight from previous years
<u>Knowledge</u> Phenomena	Rain is drops of water that fall from clouds. A shadow is a dark shape that can be seen on a floor or wall. Shadows are made when a solid object blocks light.	A shadow is formed when light from a light source, such as the Sun, is blocked by an opaque object, but not by transparent objects. When an instrument is played by plucking, striking or blowing, the air around or inside it vibrates. These vibrations travel as a sound wave to the ear.		A light source is something that produces light. A reflector is something that reflects light. Light is a form of energy that travels in straight lines from a light source. Dark is the absence of light and we need light to be able to see. The main natural light source on Earth is the Sun. Opaque objects cast dark shadows. Translucent objects cast lighter, blurry shadows. Transparent objects allow light to pass through them and do not create shadows. Shadows change when the light source or the object moves. The lower the light source the longer the shadow. A shadow is an area of darkness made when an object blocks light. A shadow is the same shape as the object that casts it because light travels in straight lines. Shadows always appear on the opposite side of the light source. Sound waves travel through a medium, such as air or water, to the ear. A sound source is something that vibrates and creates a sound, such as human vocal cords, part of a musical instrument or a piece of machinery. Volume is a measure, in decibels, how loud or quiet sound is. Applying more force to a sound source adds more energy and results in a louder sound. Pitch is how high or low a sound is. Generally, the longer, looser, bigger and thicker the sound source is the lower the pitch.		All planets are spherical because their mass is so large that they have their own force of gravity. This force of gravity pulls all of a planet’s material towards its centre, which compresses it into the most compact shape – a sphere. Refraction is the bending of light as it passes from one transparent material to another. Refracted light creates a visible spectrum when white light shines through a prism or raindrops. Shadows are formed when an object blocks the passage of light, leaving an area of darkness (the absence of light). Shadows move and change shape during the day as Earth rotates and the Sun appears in different positions in the sky. Light is a form of energy that travels as waves in straight lines. There are natural and artificial light sources. Light rays bounce off a reflector’s surface, making it appear to light up. The Sun is the natural source of light and heat for Earth. Sunlight contains harmful ultraviolet (UV) rays. UVA rays age our skin and UVB rays cause sunburn. UV rays increase the risk of skin cancer. The Earth rotates on its axis once every 24 hours. When a part of the Earth rotates to face the Sun, the light creates daytime. When it rotates away from the Sun, the absence of light creates night time. Light waves travel faster than sound waves. Light speed is nearly 300 million metres per second, the fastest thing in the universe. When light hits an object, it is absorbed, scattered, reflected or a combination of all three. Light from a source or reflected light enter the eye. Vertebrates, such as mammals, birds and reptiles, have a cornea and lens that refracts light that enters the eye and focuses it on the nerve tissue at the back of the eye, which is called the retina. Once light reaches the retina, it is transmitted to the brain via the optic nerve.	

				Generally, the shorter, tighter, smaller and thinner the sound source is the higher the pitch. Distant and direction of sound can be judged. When energy is put into a sound source it starts to vibrate. These vibrations disturb tiny particles of air. They vibrate and collide with each other, creating sound waves. When the sound waves enter the ear, the eardrum vibrates. These vibrations pass through small bones, called ossicles, and are turned into electrical signals in the cochlea. They travel to the brain and are interpreted as sounds. A sound wave diagram can be drawn as a wavy line with peaks and troughs. The distance between two peaks or troughs is called a wavelength. The shorter the wavelength the higher the pitch of a sound. The longer the wavelength the lower the pitch of the sound. The smaller the peaks and troughs the quieter the sound. The larger the peaks and troughs the louder the sound.			
<u>Skills</u> Forces and Electricity	Describe, predict and sort things that float and sink and talk about the forces that they can feel.	Investigate weather using toys, models or simple equipment.	Sort and group objects that float and sink.	Explain that an object will not move unless a push or pull force is applied, describing forces in action and whether the force requires direct contact or whether the force can act at a distance (magnetic force).	Predict and describe whether a circuit will work based on whether or not the circuit is a complete loop and has a battery or cell.	Explain that object fall to Earth due to the force of gravity.	Explain how the brightness of a lamp or volume of a buzzer is affected by the number and voltage of cells used in a circuit.
<u>Knowledge</u> Forces and Electricity	Some objects float and others sink. When an object sinks it falls through water to the bottom of the vessel. An object that floats stays at the water's surface.	Simple equipment can be used for measuring weather including windsocks, thermometers and rain gauges. Some objects float and others sink		Forces cause objects to move, change speed or change shape. Some push and pull forces require direct contact. Friction is a force between two surfaces as they move across each other. Friction slows down a moving object. Friction produces heat, which can be a problem.		Gravitational force, or gravity, is a non-contact, pulling force between objects that have mass. Gravitational force increases as the mass of an object increases. The mass of the Earth is very large so it exerts a gravitational force large enough for its effects to be seen. Voltage is measured in volts (V). The bigger the voltage, the more electrons are pushed through the circuit. The more voltage flowing through a lamp, buzzer or motor, the brighter the lamp, the louder the buzzer and the faster the motor.	
<u>Skills</u> Staying safe	Follow instructions when in different environments and when handling simple equipment, such as scissors.	Describe ways to stay safe in some familiar situations.	Describe what humans need to survive.	Explain why light from the Sun can be dangerous.	Explain the precautions needed for working safely with electrical circuits.	Explain the precautions needed for working safely when heating, burning, cooling and mixing materials.	Explain the dangers of using lasers and ways to use them safely.
<u>Knowledge</u> Staying safe	Plants need air, sunlight, warmth, water and nutrients from soil to grow.	Ways to stay safe include: using sun cream and wearing a hat in the Sun; stopping, looking and listening when crossing the road; not touching sharp or hot objects; only eating or drinking what you know or have been given by an adult you trust. Using sun cream and wearing a hat helps you to stay safe in the Sun. Humans need water, food, air and shelter to survive.		Light from the Sun is damaging for vision and the skin. People can protect themselves from the Sun by using sun cream, wearing sun hats and sunglasses and by staying indoors or in the shade. Working with electrical circuits can be dangerous.		Very hot and very cold materials can burn skin. Lasers are intense beams of light and they should never be pointed at people's faces or aircraft.	

Skills Pattern Seeking	Notice and begin to describe patterns of weather in summer and winter.	Observe changes across the four seasons.	Describe typical UK seasonal weather patterns.	Find patterns in the way shadows change during the day.	Compare and find patterns in the pitch of a sound, using a range of equipment, such as musical instruments Compare and find patterns in the volume of a sound, using a range of equipment, such as musical instruments.	Use the idea of Earth's rotation to explain day and night, and the Sun's apparent movement across the sky.	Explain, using words, diagrams or a model, why shadows have the same shape as the objects that cast them and how shadows can be changed.
Knowledge Pattern Seeking	The weather, plants and animals in the local environment, change throughout the year. The weather and environment changes with the seasons.	The four seasons are spring, summer, autumn and winter. Certain events and weather patterns happen in different seasons. The UK has typical weather in each of the seasons. For example, winter is cold and sometimes frosty, whereas summer is warm and sometimes sunny. Many animals behave differently in different seasons in the UK. These different behaviours, such as migration and hibernation, are linked to their life cycles, with spring often being the time for new offspring.		Shadows change shape and size when the light source moves. The higher the light source the shorter the shadow. The lower the light source the longer the shadow. Pitch is how high or low a sound is. Generally, the longer, looser, bigger and thicker the sound source is the lower the pitch. Generally, the shorter, tighter, smaller and thinner the sound source is the higher the pitch. Sounds are louder when more energy is put into a sound source because the vibrations and sound waves are larger. The volume of sound is measured in decibels (dB).		As Earth orbits the Sun, it also spins on its axis. It takes Earth a day (24 hours) to complete a full spin. During the day, the Sun appears to move through the sky. The Sun is not moving the Earth is rotating. Earth rotates to the east or, if viewed from above the North Pole, it rotates anti-clockwise, which means the Sun rises in the east and sets in the west. As Earth rotates, different parts of it face the Sun, which brings what we call daytime. The part facing away is in shadow, which is night time. Sundials block sunlight to cast a shadow. As the Earth rotates, the angle of the sunlight upon the sundial changes, and the shadow changes length and direction. When a light source is close to an object, the shadow is large because the object is blocking more of the light coming from the source. As a light source moves further away from an object, the shadow gets smaller because the object blocks less light coming from the source.	
Skills Changes	Notice and talk about the differences in day length between the seasons.	Observe and describe how day length changes across the year.	Describe how some objects and materials can be changed and how these changes can be desirable or undesirable.	Describe simply how fossils are formed, using words, pictures or a model.	Observe and explain that some materials change state when they are heated or cooled and measure or research the temperature in degrees Celsius (°C) at which materials change state.	Identify, demonstrate and compare reversible and irreversible changes.	Describe some significant changes that have happened on Earth and the evidence, such as fossils, that support this.
Knowledge Changes	The days are longer in summer and shorter in winter.	Day length is the number of hours of daylight. Day length is longer in the summer months and shorter in the winter months in the UK. Some objects and materials can be changed by squashing, bending, twisting, stretching, heating, cooling, mixing and being left to decay.		Fossils form over millions of years and are the remains of a once-living organism, preserved as rock. Scientists can use fossils to find out what life on Earth was like in prehistoric times. Heating or cooling materials can bring about a change of state. This change of state can be reversible or irreversible. Melting is the process of a solid changing into a liquid. Freezing is the process of a liquid changing into a solid. Evaporation is the process of a liquid changing into a gas. Condensation is the process of a gas changing into a liquid. Temperature is a measure of how hot or cold something is. It is measured in degrees (°) using an instrument called a thermometer. The three different scales temperature can be measured in are Celsius (°C), Fahrenheit (°F) and Kelvin (K). We use the Celsius scale in the UK. When solid water (ice) is heated to 0°C, it begins to melt. This is called its melting point. When liquid water is cooled to 0°C, it begins to freeze. This called its freezing point. When liquid water is heated to 100°C, it begins to evaporate. This is called its boiling point. When gaseous water (water vapour) is cooled to 100°C, it begins to condense. This is called its condensing point.		Reversible changes include heating, cooling, melting, dissolving and evaporating. Irreversible changes include burning, rusting, decaying and chemical reactions. Irreversible changes are usually accompanied by one or more of these signs: a gas is produced; light is produced; a smell is produced or the smell changes; the colour changes; sound is produced, or the temperature changes.	

				On Earth, temperatures range from around -80°C at their lowest to around 50°C at their highest. Materials exist as solids, liquids or gases. A material's state on Earth depends on Earth's temperature because materials have different melting and boiling point.			
Skills Modelling	Explore and describe electrical and non-electrical light sources.	Describe, following exploration, what simple electrical circuits can do.	Make models with moving parts.	Make working models with simple mechanisms or electrical circuits.	Construct operational simple series circuits using a range of components and switches for control.	Describe and demonstrate how simple levers, gears and pulleys assist the movement of objects.	Create circuits using a range of components and record diagrammatically using the recognised symbols for electrical components.
Knowledge Modelling	Dark is the absence of light.	Electrical circuits can light lamps or sound a buzzer. A switch turns an electrical circuit off and on. Models can have moving parts that use levers, sliders, wheels and axles.		A circuit is a collection of components connected by wires through which an electric current can flow. A circuit must be a complete loop to work. A series circuit has a single path for an electric current to flow through.		A lever is a simple machine that provides a mechanical advantage to make it easier to lift a heavy load. A lever consists of a lever arm, a fulcrum, a load and effort. As the distance between the fulcrum and the effort increases, the effort needed to lift a load decreases. A pulley is a simple machine that provides a mechanical advantage to make it easier to lift a heavy load. A pulley consists of one or more grooved wheels and a rope. As the number of wheels, and the number of pieces of rope supporting the pulleys, increases, the effort needed to lift an object decreases, but the distance the rope has to be pulled increases. Gears are toothed, interlocking wheels that can be place together to make a mechanism that provides a mechanical advantage. Linking different sized gears creates a mechanical advantage. Smaller gears rotate more quickly and are easier to turn but do not provide much force. Larger gears rotate more slowly and are harder to turn but provide more force. Mechanisms, such as levers, pulleys and gears, give us a mechanical advantage. The bigger the mechanical advantage, the less force we need to apply. Electrical symbols represent electrical components such as a switch, buzzer or lamp. Electricity is a form of energy that makes things work. Circuit components include cells, buzzers, switches, wires, lamps and motors. A collection of components connected by wires in a loop is called a series circuit.	
VOCABULARY (for all of the above)	Light, dark, night, day, air, water, soil	Lever, slider, wheel, axle, light, lamp, buzzer, switch , warmth,		Electricity, electrical circuit, appliance Cell, wire, bulbs, switches, buzzer, switch, Conductor, insulator		Solar system, rotate, orbit, axis, spherical, hemisphere Gravity, air resistance, water resistance, friction, pulley, lever, mechanism Travel, reflection, light source, transparent, spectrum, opaque, retina Voltage, brightness, volume, series circuit, circuit diagram, component	
Skills Identification and classification – materials incl. rocks	Name and sort everyday items into groups of the same material.	Identify and name what an object is made from, including wood, plastic, glass, metal, water and rock.	Observe what happens when a range of everyday materials, including foods, are heated and cooled, sorting and grouping them based on their observations.	Group and sort materials as being reflective or non-reflective.	Group and sort materials into solids, liquids or gases.	Compare and group everyday materials by their properties, including hardness, solubility, transparency, conductivity (electrical and thermal) and magnetism. Explain, following observation, that some substances (solutes) will dissolve in liquid (solvents) to form a solution and the solute can be recovered by evaporating off the solvent.	Investigate and identify good thermal insulators, describing their common features.

<u>Knowledge</u> Identification and Classification – materials incl rocks	Identify that materials have different properties and explore and sort magnetic and non-magnetic materials through play and exploration.	Investigate and describe the simple physical properties of some everyday materials, such as hard or soft; stretchy or stiff; rough or smooth; opaque or transparent; bendy or rigid and waterproof or not waterproof.	Compare the suitability of a range of everyday materials for particular uses, including wood, metal, plastic, glass, brick, rock, paper and cardboard.	Compare and group rocks based on their appearance, properties or uses. Compare and group materials based on their magnetic properties.	Describe materials as electrical conductors or insulators.	Separate mixtures by filtering, sieving and evaporating. Describe, using evidence from comparative or fair tests, why a material has been chosen for a specific use, including metals, wood and glass.	Describe, using diagrams, how light behaves when reflected off a mirror (plane, convex or concave) and when passing through a lens (concave or convex).
	Some materials are magnetic, which means that they are attracted to (pull towards) a magnet. Some metals are magnetic. Other materials are non-magnetic, such as wood, dough and glass.	Materials have different properties, such as hard or soft; stretchy or stiff; rough or smooth; opaque or transparent; bendy or rigid; waterproof or not waterproof. A material's physical properties make it suitable for particular purposes, such as glass for windows and brick for building walls. Objects can be made from one material, more than one material or different materials with similar properties.		Sedimentary, igneous and metamorphic are the three different rock types. Sedimentary rocks form from mud, sand and particles that have been squashed together over a long time to form rock. Igneous rocks are made from cooled magma or lava. Metamorphic rocks are formed when existing rocks are heated by the magma under the Earth’s crust or squashed by the movement of the Earth’s tectonic plates. Magnetic materials are attracted to magnets. Iron, cobalt, nickel and steel are magnetic metals. Other metals and materials such as plastic, paper, glass and wood are not magnetic. Electrical conductivity is a measure of a material’s ability to allow an electric current to pass through it. Electrical conductors, like metals, have low resistance and allow electricity to flow through them. Non-conductive materials, like plastics, are often known as electrical insulators they do not let electricity through, they have high resistance.		A mixture is a combination of two or more substances that aren’t chemically joined and can be separated back into their individual substances. Heterogeneous mixtures consist of distinctly different substances and are easy to separate by classifying and grouping or sieving or filtering. Substances in homogeneous mixtures are evenly distributed and you cannot see the different parts. Homogeneous substances are difficult to separate. Sieving can be used to separate large solids from liquids and some solids from other solids. Filtering can be used to separate small solids from liquids. Evaporating can be used to separate dissolved solids from liquids. A material's properties dictate what it can be used for. Plane mirrors are flat, concave mirrors curve inwards and convex mirrors curve outwards. Plane mirror reflections are the same size, and the right way up but they are reversed. Concave mirrors enlarge the image and concentrate the rays of light into a focal point. Convex mirrors make images smaller and disperse light which reflects a wider view.	
<u>Skills</u> materials	Compare and group objects and materials according to simple given criteria.	Compare and group materials in a variety of ways, such as based on their physical properties; being natural or human-made and being recyclable or non-recyclable.	Compare and group things that are living, dead or have never been alive.	Investigate and compare a range of magnets (bar, horseshoe and floating) and explain that magnets have two poles (north and south) and that opposite poles attract each other, while like poles repel each other.	Compare common household equipment and appliances that are and are not powered by electricity.	Compare the life cycles of animals, including a mammal, an amphibian, an insect and a bird.	Compare the living things in two contrasting areas of a habitat (top vs bottom of a hill, full sun vs shade, exposed location vs sheltered location or well-trodden path vs unused area).
<u>Knowledge</u> materials	Materials can feel soft, smooth, rough, squashy thick and thin. Objects can be grouped according to how they feel.	A property is a quality a material has. Materials with different properties have different uses.		Magnetism is a non-contact force. Magnets have two poles (north and south). Opposite poles (north and south) attract each other.		Embryo, juvenile, adolescent and adult are stages of a mammal's life cycle. Egg, larva (tadpole), adolescent and adult are stages of an amphibian's life cycle.	

	Soft materials bend easily. They are not hard or rough to touch. Hard materials are difficult to bend break and cut. Smooth materials have no lumps, bumps or holes. Some objects block light and make a shadow. Some objects let light through. Buildings are made from different materials, including brick, wood, glass, wood, plastic and metal. Materials have special properties, which make them useful for different jobs.	Living things are those that are alive. Dead things are those that were once living but are no longer. Some things have never been alive. The seven life processes of living things are moving, breathing, using their senses, feeding, getting rid of waste, having offspring and growing.		Like poles (north and north, or south and south) repel each other. There are different types of magnets including bar magnets, horseshoe magnets and floating magnets. Magnets have different strengths. Electricity is a type of energy. It is used to power many everyday items. Electricity comes from two sources, mains and batteries.		Egg, larva, pupa and adult are the stages of some insects including butterflies, beetles and bees. Egg, baby, adolescent and adult are stages of a bird's life cycle. A life cycle is the series of changes in the life of a living thing and includes these basic stages: birth, growth, reproduction and death. A mammal is a vertebrate, which means it has a backbone. Producing milk to feed their young, being warm blooded, giving birth to live young, having fur or hair and breathing air with lungs are the five key characteristics of mammals. All mammalian life cycles have the same processes of birth, growth, puberty and reproduction as well as the same stages. The duration of each life cycle stage is different for different mammals. Environmental factors can affect the distribution of living things within a habitat. These factors include light (intensity and duration), weather, altitude, soil type and humans, such as when we mow or trample grass.	
<u>VOCABULARY</u> <u>(for all of above)</u>	rough/smooth, bendy/not bendy	Material, object, squash, bend, twist, stretch, waterproof/not waterproof,		Attract, repel, poles, magnetic force, frictional forces, bar magnet Fossil, Sedimentary, igneous and metamorphic rock particles, organic matter, lava		Thermal conductivity, solubility, transparency, filtering, sieving, dissolve Irreversible and reversible change	
<u>Skills</u> Measurement	With support, use simple equipment, such as timers, rulers and containers, to measure more or less	With support, use simple equipment to measure and make observations.	Use simple equipment to measure and make observations.	Take measurements in standard units, using a range of simple equipment.	Measure in standard units independently Read scales that are labelled.	Use specific equipment designed for a task such as newton meters and trundle wheels , temperature gauges etc. Read and interpet scales and their intervals.	Choose the best unit and apparatus to measure in for a task at hand.
<u>Knowledge</u> Measurement	Simple equipment can be used to measure distance, height, weight and time.	Simple equipment is used to take measurements and observations. Examples include metre sticks, measuring tapes, egg timers and hand lenses. Simple equipment is used to take measurements and observations. Examples include timers, hand lenses, metre sticks and trundle wheels.		Equipment is used to take measurements in standard units. Examples include data loggers plus sensors, timers (seconds, minutes and hours), thermometers (°C) and metre sticks (millimetres, centimetres and metres). Taking repeat readings can increase the accuracy of the measurement. Equipment is used to take measurements in standard units. Examples include data loggers plus sensors, timers (seconds, minutes and hours), thermometers (°C), and metre sticks, rulers or trundle wheels (millimetres, centimetres, metres).		A force meter can be used to measure an object's mass in grams (g) or kilograms (kg) and its weight in newtons (N). Many people commonly mix up and misuse the words mass and weight. Mass is the amount of matter that an object or substance contains. Weight is a measure of gravitational force which is different on for example Earth and the Moon. Resting heart rate is the number of times a heart beats per minute when a person is at rest. Heart rate can be measured by recording the pulse at different points of the body. A heart rate monitor can also be used to measure the pulse. Specialised equipment is used to take accurate measurements in standard units including light sensors measuring light intensity (lux).	
<u>Skills</u> Gather and record data	Record data in simple tables and pictograms.	With support, gather and record simple data in a range of ways (data tables, diagrams, Venn diagrams).		Use a range of methods (tables, charts, diagrams and Venn diagrams) to gather and record simple data with some accuracy. Understand and compare a timeline as a linear diagram and a life cycle is a circular diagram.		Gather and record findings in a variety of ways (diagrams, tables, charts and graphs) with increasing accuracy. Use and understand Classification keys Understand a line graph can show changes over time- flat line – no change, steep curve, quick change.	
<u>Skills</u> Questioning	Ask a relevant scientific question to find out more, explain how things work and why they might happen.	Ask simple scientific questions.		Ask and answer scientific questions about the world around them.		Ask questions about the world around them and explain that they can be answered in different ways.	
<u>Skills</u> Investigation	Observe how activities are going and adapt their ideas if necessary.	With support, follow instructions to perform simple tests and begin to talk about what they might do or what might happen.		Follow a set of instructions to perform a range of simple tests, making simple predictions for what might happen and suggesting ways to answer their questions.		Set up and carry out some simple, comparative and fair tests, making predictions for what might happen.	
<u>Skills</u> Observation	With support, observe, record and talk about materials and living things.	Observe objects, materials, living things and changes over time, sorting and grouping them based on their features.		Observe objects, materials, living things and changes over time, sorting and grouping them based on their features and explaining their reasoning.		Make increasingly careful observations, identifying similarities, differences and changes and making simple connections.	

<u>Skills</u> Report and Conclude	Represent scientific observations by mark making, drawing or creating simple charts and tables. Offer explanations for why things happen, making use of vocabulary, such as, because, then and next.	Talk about what they have done and say, with help, what they think they have found out.	Begin to notice patterns and relationships in their data and explain what they have done and found out using simple scientific language.	Use suitable vocabulary to talk or write about what they have done, what the purpose was and, with help, draw a simple conclusion based on evidence collected, beginning to identify next steps or improvements.	Use scientific vocabulary to report and answer questions about their findings based on evidence collected, draw simple conclusions and identify next steps, improvements and further questions.	Use relevant scientific vocabulary to report on their findings, answer questions and justify their conclusions based on evidence collected, identify improvements, further questions and predictions.	Report on and validate their findings, answer questions and justify their methods, opinions and conclusions, and use their results to suggest improvements to their methodology, separate facts from opinions, pose further questions and make predictions for what they might observe.
<u>VOCABULARY</u> (for all of above)	Question, answer, observe, sort equipment, group, record compare,	, observing, equipment, identify, classify, , diagram, chart, map, data, contrast, describe, biology, chemistry, physics, group, record Question, answer, observe, observing, identify, classify, sort, diagram, chart, map, data, compare, contrast, describe, biology, chemistry, physics,			Research, relevant, questions, scientific enquiry, comparative and fair test, systematic, careful observation, accurate, measurements, data, gather, record, classify, present, record, drawings, labelled diagrams, keys, bar charts, tables, oral and written explanations, conclusion, predictions, differences, similarities, changes, evidence, improve, secondary sources, guides, keys, construct, interpret, thermometer, data logger	plan, variables, measurements, accuracy, precision, repeat readings, record data, scientific diagrams, labels, classification keys, tables, scatter graphs, bar graphs, line graphs, predictions, further comparative and fair tests, report and present conclusions, causal relationships, explanations, degree of trust, oral and written display and presentation, evidence, support ideas, refute arguments, identify, classify, describe, patterns, systematic, quantitative, measurements	