Science curriculum

A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all children should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, children should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

Science scheme of learning

EYFS			
Subject	Knowledge	Skills	Key Vocabulary
ELG: The Natural World Children at the expected level of development will: - Explore the natural world around them, making observations and drawing pictures of animals and plants; 15 - 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; - Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	- Children know the properties of familiar objects - Children know the properties of familiar materials - Children know the features of familiar places, home, school, their local area, for example weather, seasons, human and natural resources. - Children know the features of animals and plants in their locality and other regions studied including appearance, diet and habitat - Children know that things change over time including life cycles of plants and animals - Children know simple reasons why things occur *for example – 'The ice has melted because it warmed up'*	• Children can identify the properties of objects *e.g. 'It is hard, if you drop it, it won't break'* • Children can identify the properties of materials *e.g. 'It's waterproof – the paper underneath is not wet'* • Children can identify the features of their immediate environment and other regions studied. *E.g. 'There are lots of fields where we live but in London there are lots of buildings'* • Children can identify the features of plants and animals • Children can identify changes • Children can explain their thinking and understanding orally • Children can compare and contrast animals, plants, places and objects. • Children can make observations	*because* *habitat* *environment* *plants* *animals* *diet* *descriptive language relating to objects and materials* *descriptive language relating to places*

Key Stage 1 – Seasons and weather		
Knowledge	**Know How**	**Key Vocabulary**
Observe changes across the four seasons Observe and describe weather associated with the seasons and how day length varies. Understand how seasonal changes affect flora and fauna	Children should observe and talk about changes in the weather and the seasons. Children should conduct seasonal research, such as collecting rain fall data / wind direction. **Note:** Children should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses. Children might work scientifically by: making tables and charts about the weather; and making displays of what happens in the world around them, including day length, as the seasons change.	year season spring summer autumn winter sunny cloudy windy dry temperature climate
Big Ideas: If it is asking you to describe then you need the vocabulary to describe it. Eg if it is windy then you need to understand what wind was.		

Key Stage 1 – Materials		
Knowledge	**Know How**	**Key Vocabulary**
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.	Children should explore, name, discuss and raise and answer questions about everyday materials so that they become familiar with the names of materials and properties. Children should explore and experiment with a wide variety of materials, not only those listed in the programme of study. Children might work scientifically by: performing simple tests to explore questions, for example: 'What is the best material for an umbrella? ...for lining a dog basket? ...for curtains? ...for a bookshelf? ...for a gymnast's leotard?'	hard/soft stretchy/stiff shiny/dull rough/smooth bendy/not bendy waterproof/not waterproof absorbent/not absorbent opaque/transparent brick paper fabrics elastic (noun) foil
Big Ideas: Everything is made out of something and there is a variety of different materials		

Key Stage 1 - Sound		
Knowledge	**Know How**	**Key Vocabulary**
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 source increases.	Children should explore and identify the way sound is made through vibration in a range of different musical instruments from around the world; and find out how the pitch and volume of sounds can be changed in a variety of ways. Children might work scientifically by: finding patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses. They might make earmuffs from a variety of different materials to investigate which provides the best insulation against sound. They could make and play their own instruments by using what they have found out about pitch and volume.	sound vibration medium ear pitch volume faint(er) source of the sound thickness insulation
Big Ideas: There is a source for every sound. Sound radiates out from its source. Sounds travels at 343 meters per second.		

Key Stage 1 – Building things		
Knowledge	**Know How**	**Key Vocabulary**
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.	Children should identify and discuss the uses of different everyday materials so that they become familiar with how some materials are used for more than one thing (metal can be used for coins, cans, cars and table legs; wood can be used for matches, floors, and telegraph poles) or different materials are used for the same thing (spoons can be made from plastic, wood, metal, but not normally from glass). They should think about the properties of materials that make them suitable or unsuitable for particular purposes and they should be	wood metal plastic glass brick rock paper cardboard solid liquid

	encouraged to think about unusual and creative uses for everyday materials. Children might find out about people who have developed useful new materials, for example John Dunlop, Charles Macintosh or John McAdam. Children might work scientifically by: comparing the uses of everyday materials in and around the school with materials found in other places (at home, the journey to school, on visits, and in stories, rhymes and songs); observing closely, identifying and classifying the uses of different materials, and recording their observations.	gas squashing bending twisting stretching elastic (v) properties suitable unsuitable
Big Ideas: some materials are more suitable for specific jobs (glass or cling film for a window?) A combination of factors are needed to choose the most appropriate.		

Key Stage 1 - Plants		
Knowledge	**Know How**	**Key Vocabulary**
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. Investigate, 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.	Children should use the local environment throughout the year to explore and answer questions about plants growing in their habitat. Where possible, they should observe the growth of flowers and vegetables that they have planted. They should become familiar with common names of flowers, examples of deciduous and evergreen trees, and plant structures. Children should be introduced to the requirements of plants for germination, growth and survival, as well as to the processes of reproduction and growth in plants. Children might work scientifically by: observing closely, perhaps using magnifying glasses, and comparing and contrasting familiar plants; describing how they were able to identify and group them, and drawing diagrams showing the parts of different plants including trees.	plant deciduous evergreen leaves flowers (blossom) petals fruit roots bulb seed trunk bud branches stem magnifying glass

Big Ideas: Plants are living things. Trees are living things. Plants have key structures and they have specific names.

Key Stage 1 – Animal Kingdom		
Knowledge	**Know How**	**Key Vocabulary**
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 plants, and how they depend on each other Identify and name a variety of plants and animals in their habitats, including micro-habitats Children know what an invertebrate and vertebrate are. Children know the differences between mammals and birds. 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.	Children should be introduced to the idea that all living things have certain characteristics that are essential for keeping them alive and healthy. They should raise and answer questions that help them to become familiar with the life processes that are common to all living things. Children should be introduced to the terms 'habitat' (a natural environment or home of a variety of plants and animals) and 'micro-habitat' (a very small habitat, for example for woodlice under stones, logs or leaf litter). They should raise and answer questions about the local environment that help them to identify and study a variety of plants and animals within their habitat and observe how living things depend on each other, for example, plants serving as a source of food and shelter for animals. Children should compare animals in familiar habitats with animals found in less familiar habitats, for example, on the seashore, in woodland, in the ocean, in the rainforest. Children might work scientifically by: sorting and classifying things according to whether they are living, dead or were never alive, and recording their findings using charts. They should describe how they decided where to place things, exploring questions for example: 'Is a flame alive? Is a deciduous tree dead in winter?' and talk about ways of answering their questions. They could construct a simple food chain that includes humans (e.g. grass, cow, human). They could describe the conditions in different habitats and micro-habitats (under log, on stony path, under bushes) and find out how the conditions affect the number and type(s) of plants and animals that live there.	characteristics living non-living dead habitat micro-habitat food chain source environment food shelter seashore sea ocean woodland forest rainforest invertebrate vertebrate
Big Ideas: Things are either living, dead or have never been alive. What makes something living? (Trees breathe) Different habitats, which have creatures, which are adapted to live there. Animals obtain their food from plants and other animals. Plants get their energy from the sun.		

Key Stage 1 - Light		
Knowledge	**Know How**	**Key Vocabulary**
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 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.	Children should explore what happens when light reflects off a mirror or other reflective surfaces, including playing mirror games to help them to answer questions about how light behaves. They should think about why it is important to protect their eyes from bright lights. They should look for, and measure, shadows, and find out how they are formed and what might cause the shadows to change. **Note:** Children should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses. Children might work scientifically by: looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes.	light dark shadow reflect(ive) mirror surface natural/artificial source of light block opaque translucent transparent
Big Ideas: Light needs to come from a light source which can be natural or man-made. Darkness is the absence of light. Light travels in a straight line.		

Key Stage 1 – Human Lifestyle		
Knowledge	**Know How**	**Key Vocabulary**
Notice that animals, including humans, have offspring which grow into adults Find out about and describe the basic needs of humans for survival (water, food and air)	Children should be introduced to the basic needs of humans for survival, as well as the importance of exercise and nutrition for humans. They should also be introduced to the processes of reproduction and growth in animals. The focus at this stage should be on questions that help children to recognise growth; they should not be expected to understand how reproduction occurs.	animal human reproduction offspring baby toddler child teenager

Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	Growing into adults can include reference to baby, toddler, child, teenager, adult. Children might work scientifically by: observing, through video or first-hand observation and measurement, how different animals, including humans, grow; asking questions about what things animals need for survival and what humans need to stay healthy; and suggesting ways to find answers to their questions.	adult life-cycle egg, chick, chicken; egg, caterpillar, pupa, butterfly; spawn, tadpole, frog; lamb, sheep grow(th) water food air survival exercise nutrition diet (eating habits) hygiene health(y)
Big Ideas: You need to need a variety of factors to be healthy. Living things have stages in their growth.		

Key Stage 1 - Changing materials		
Knowledge	**Know How**	**Key Vocabulary**
Distinguish between manmade and natural materials Describe the simple physical properties of a variety of everyday materials Know how materials including solids can be changed Understand when materials are absorbent Understand why we change materials	Children should explore, name, discuss and raise and answer questions about everyday materials so that they become familiar with the names of materials and properties. Children should explore and experiment with a wide variety of materials, not only those listed in the programme of study. Children should investigate the properties of materials and draw conclusions from their results. Children might work scientifically by: performing simple tests to explore questions, for example: 'What is the best material for an umbrella? ...for lining a dog basket? ...for curtains? ...for a bookshelf? ...for a gymnast's leotard?'	hard/soft stretchy/stiff shiny/dull rough/smooth bendy/not bendy waterproof/not waterproof absorbent/not absorbent opaque/transparent brick paper fabrics elastic (noun) foil

Big Ideas: Everything is made out of something and there is a variety of different materials		

Key Stage 1 - Space		
Knowledge	**Know How**	**Key Vocabulary**
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 Understand how space has been explored and understood	Children should be introduced to a model of the Sun and Earth that enables them to explain day and night. Children should learn that the Sun is a star at the centre of our solar system and that it has eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune (Pluto was reclassified as a 'dwarf planet' in 2006). They should understand that a moon is a celestial body that orbits a planet (Earth has one moon; Jupiter has four large moons and numerous smaller ones) **Note:** Children should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses. Children should find out about the way that ideas about the solar system have developed, understanding how the geocentric model of the solar system gave way to the heliocentric model by considering the work of scientists such as Ptolemy, Alhazen and Copernicus. Children might work scientifically by: comparing the time of day at different places on the Earth through internet links and direct communication; creating simple models of the solar system; constructing simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day; finding out why some people think that structures such as Stonehenge might have been used as astronomical clocks.	Solar system Sun star Earth Moon orbit spherical rotation day night seasons Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune, Pluto Sundial midday midnight astronomical
Big Ideas: Sun is the centre of the solar system. The moon is a satellite which orbits the Earth and the phases of the moon are as a result of this. A day is one full rotation on its axis. A year is a full orbit of a star. Children need to be aware of distances and how far apart they are.		

Key Stage 1 - Habitats		
Knowledge	**Know How**	**Key Vocabulary**
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 plants, and how they depend on each other Identify and name a variety of plants and animals in their habitats, including micro-habitats	Children should be introduced to the idea that all living things have certain characteristics that are essential for keeping them alive and healthy. They should raise and answer questions that help them to become familiar with the life processes that are common to all living things. Children should be introduced to the terms 'habitat' (a natural environment or home of a variety of plants and animals) and 'micro-habitat' (a very small habitat, for example for woodlice under stones, logs or leaf litter). Children should compare animals in familiar habitats with animals found in less familiar habitats, for example, on the seashore, in woodland, in the ocean, in the rainforest. Children might work scientifically by: sorting and classifying things according to whether they are living, dead or were never alive, and recording their findings using charts. They should describe how they decided where to place things, exploring questions for example: 'Is a flame alive? Is a deciduous tree dead in winter?' and talk about ways of answering their questions. They could construct a simple food chain that includes humans (e.g. grass, cow, human). They could describe the conditions in different habitats and micro-habitats (under log, on stony path, under bushes) and find out how the conditions affect the number and type(s) of plants and animals that live there.	characteristics living non-living dead habitat micro-habitat food chain source environment food shelter seashore sea ocean woodland forest rainforest
Big Ideas: Things are either living, dead or have never been alive. What makes something living? (Trees breathe) Different habitats, which have creatures, which are adapted to live there. Animals obtain their food from plants and other animals. Plants get their energy from the sun.		

Key Stage 1 – Mixing and making		
Knowledge	**Know How**	**Key Vocabulary**
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)	Children should explore a variety of everyday materials and develop simple descriptions of the states of matter (solids hold their shape; liquids form a pool not a pile; gases escape from an unsealed container). Children should observe water as a solid, a liquid and a gas and should note the changes to water when it is heated or cooled. **Note:** Teachers should avoid using materials where heating is associated with chemical change, for example, through baking or burning.	states of matter solid liquid gas properties particles evaporation solidification condensation

Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	Children might work scientifically by: grouping and classifying a variety of different materials; exploring the effect of temperature on substances such as chocolate, butter, cream (for example, to make food such as chocolate crispy cakes and ice-cream for a party). They could research the temperature at which materials change state, for example, when iron melts or when oxygen condenses into a liquid. They might observe and record evaporation over a period of time, for example, a puddle in the playground or washing on a line, and investigate the effect of temperature on washing drying or snowmen melting.	the water cycle melting
Big Ideas: Materials can change state. Materials can exist in all three states. The relative density of a material determines its state.		

Lower KS2 – Practical skills		
Knowledge	**Know How**	**Key Vocabulary**
Know how to plan a 'fair test' Know how to work as part of a team Identify good scientific diagrams Know how to present results Know how to interpret results Know how to present a conclusion Know how to edit an investigation report	Identify the variables in a range of experiments Define a dependent, independent and control variable Can follow the instructions in a method Can write a method for an investigation Draw a range of scientific diagrams Can use scientific diagrams to identify an organism or object Describe how to collect results Can draw a results table Can write a conclusion Can draft an investigation report Can redraft an investigation report	Test Diagrams Results Conclusion Investigation Variable Experiment Method Organism report

Lower Key Stage 2 - Forces		
Knowledge	**Know How**	**Key Vocabulary**
Compare how things move on different surfaces Understand how we measure forces Understand the difference in contact and non-contact forces Understand the impact forces have on objects that float Understand the impact forces have on gears, levers and pulleys	Know how to measure a force Know how to investigate the impact forces have on objects Children might work scientifically by: comparing how different things move and grouping them; raising questions and carrying out tests to find out how far things move on different surfaces and gathering and recording data to find answers their questions; exploring the strengths of different magnets and finding a fair way to compare them; sorting materials into those that are magnetic and those that are not; looking for patterns in the way that magnets behave in relation to each other and what might affect this, for example, the strength of the magnet or which pole faces another; identifying how these properties make magnets useful in everyday items and suggesting creative uses for different magnets.	forces push pull attract repel friction magnet(ic) bar magnet ring magnet button magnet horseshoe magnet contact poles/polarity
Big Ideas: Only metals containing iron are magnetic. Magnetism is a type of force		

Lower Key Stage 2 - Sound		
Knowledge	**Know How**	**Key Vocabulary**
Identify how sounds are made, associating some of them with something vibrating Understand how different sounds are produced Understand pitch, frequency and amplitude. Understand how we use sound Understand devices that use sound	Children should explore and identify the way sound is made through vibration in a range of different musical instruments from around the world; and find out how the pitch and volume of sounds can be changed in a variety of ways. Explore how sounds are made and their uses. Children might work scientifically by: finding patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses. They might make earmuffs from a variety of different materials to investigate which provides the best insulation against sound. They could make and play their own instruments by using what they have found out about pitch and volume.	sound vibration medium ear pitch volume faint(er) source of the sound thickness insulation
Big Ideas: There is a source for every sound. Sound radiates out from its source. Sounds travels at 343 meters per second.		

Lower Key Stage 2 - Adaptations		
Knowledge	**Know How**	**Key Vocabulary**
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	Children should find out more about how living things on earth have changed over time. They should be introduced to the idea that characteristics are passed from parents to their offspring, for instance by considering different breeds of dogs, and what happens when, for example, Labradors are crossed with poodles. They should also appreciate that variation in offspring over time can make animals more or less able to survive in particular environments, for example, by exploring how giraffes' necks got longer, or the development of insulating fur on the arctic fox. Children might find out about the work of palaeontologists such as Mary Anning and about how Charles Darwin and Alfred Wallace developed their ideas on evolution. **Note:** At this stage, children are not expected to understand how genes and chromosomes work.	fossils offspring characteristics breed of animal evolution inheritance adapt(ion) environment palaeontologist Mary Anning Charles Darwin Alfred Wallace Mutation

Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.	Children might work scientifically by: observing and raising questions about local animals and how they are adapted to their environment; comparing how some living things are adapted to survive in extreme conditions, for example, cactuses, penguins and camels. They might analyse the advantages and disadvantages of specific adaptations, such as being on two feet rather than four, having a long or a short beak, having gills or lungs, tendrils on climbing plants, brightly coloured and scented flowers.	
Big Ideas: Evolution is driven by need to need to survive in your environment. There is competition for finite resources. You inherit characteristics from your parents and this is supplemented by your environmental and cultural experiences.		

Lower Key Stage 2 - Plants		
Knowledge	**Know How**	**Key Vocabulary**
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 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.	Children should be introduced to the relationship between structure and function: the idea that every part has a job to do. They should explore questions that focus on the role of the roots and stem in nutrition and support, leaves for nutrition and flowers for reproduction. **Note:** Children can be introduced to the idea that plants can make their own food, but at this stage they do not need to understand how this happens. Children might work scientifically by: comparing the effect of different factors on plant growth, for example, the amount of light, the amount of fertiliser; discovering how seeds are formed by observing the different stages of plant life cycles over a period of time; looking for patterns in the structure of fruits that relate to how the seeds are dispersed. They might observe how water is transported in plants, for example, by putting cut, white carnations into coloured water and observing how water travels up the stem to the flowers.	roots stem trunk leaves flowers fruits flowering plants grow(th) air light water nutrients nutrition fertiliser transportation life cycle pollination seed formation seed dispersal factors/variables
Big Ideas: All the different parts of the plant have a particular function. The balance of factors is important to keep the plant healthy.		

Lower Key Stage 2 - Light		
Knowledge	**Know How**	**Key Vocabulary**
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 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. The structure of the eye will determine how an object is seen. Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.	Explore the way that light behaves, including light sources, reflection and shadows. They should talk about what happens and make predictions. Children might work scientifically by: deciding where to place rear-view mirrors on cars; designing and making a periscope and using the idea that light appears to travel in straight lines to explain how it works. They might investigate the relationship between light sources, objects and shadows by using shadow puppets. They could extend their experience of light by looking a range of phenomena including rainbows, colours on soap bubbles, objects looking bent in water and coloured filters (they do not need to explain why these phenomena occur).	light reflect(ion) eye light source rear-view mirror periscope shadow prism rainbow
Big Ideas: Light can be refracted. Light can be split. We can only see certain wavelengths. The angle, brightness and the distance of the light source will determine the shape and size of the shadow. Angle of incidence is the same as the angle of reflection.		

Lower Key Stage 2 - Phases of matter		
Knowledge	**Know How**	**Key Vocabulary**
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)	Children should explore a variety of everyday materials and develop simple descriptions of the states of matter (solids hold their shape; liquids form a pool not a pile; gases escape from an unsealed container). Children should observe water as a solid, a liquid and a gas and should note the changes to water when it is heated or cooled including what happens to the particles.	states of matter solid liquid gas properties particles evaporation solidification condensation

including what happens to the particles in a material. Understand how we measure boiling and melting points Know some materials don't fit into solids, liquids and gasses categories	**Note:** Teachers should avoid using materials where heating is associated with chemical change, for example, through baking or burning. Children might work scientifically by: grouping and classifying a variety of different materials; exploring the effect of temperature on substances such as chocolate, butter, cream (for example, to make food such as chocolate crispy cakes and ice-cream for a party). They could research the temperature at which materials change state, for example, when iron melts or when oxygen condenses into a liquid. They might observe and record evaporation over a period of time, for example, a puddle in the playground or washing on a line, and investigate the effect of temperature on washing drying or snowmen melting.	the water cycle melting
Big Ideas: Materials can change state. Materials can exist in all three states. The relative density of a material determines its state.		

Lower Key Stage 2 – Rock cycle		
Knowledge	**Know How**	**Key Vocabulary**
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 petrified within rock Recognise that soils are made from rocks and organic matter.	Linked with work in geography, children should explore different kinds of rocks and soils, including those in the local environment. Children should explore how rocks change on the Earth's surface. Children might work scientifically by: observing rocks, including those used in buildings and gravestones, and exploring how and why they might have changed over time; using a hand lens or microscope to help them to identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them. Children might research and discuss the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed. Children could explore different soils and identify similarities and differences between them and investigate what happens when rocks are	rock appearance physical properties fossil soil organic matter inorganic matter erosion weathering magnifying glass/hand lens microscope grains crystals igneous

	rubbed together or what changes occur when they are in water. They can raise and answer questions about the way soils are formed.	sedimentary metamorphic volcano petrified
Big Ideas: Rocks are formed in a variety of different ways. Soils are made from minerals (sand, silt, clay), organic matter, air and water.		

Lower Key Stage 2 - Ecosystems		
Knowledge	**Know How**	**Key Vocabulary**
Understand what an ecosystem is Understand that animals have varying diets Understand the role of each type of animal in an ecosystem Understand food chains and webs Understand the impact of humans on ecosystems and food webs	Children should use the local environment throughout the year to study ecosystems as well as non-local ecosystems. Children should explore the impact of animals on an ecosystem and how they are interlinked. Children should explore examples of human impact (both positive and negative) on environments, for example, the positive effects of nature reserves, ecologically planned parks, or garden ponds, and the negative effects of population and development, litter or deforestation. Children might work scientifically by: using and making simple guides or keys to explore and identify local plants and animals; making a guide to local living things; raising and answering questions based on their observations of animals and what they have found out about other animals that they have researched.	living organisms classification environment habitat ecosystem flowering/non flowering plants vertebrate invertebrate fish amphibian reptile bird mammal snails/slugs worms spiders/arachnids insects human impact environmental impact nature reserve pollution /litter deforestation

Big Ideas: Natural events and human impact can affect the environment and therefore the habitat and the organisms that live in it are also affected. Basic groups can be classified further.

Lower Key Stage 2 – Raw and synthetic materials		
Knowledge	**Know How**	**Key Vocabulary**
Children understand the differences in raw and synthetic materials. Children understand the link between raw and synthetic materials and how materials are made. Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible Children understand the importance of recycling materials	Children should build a more systematic understanding of materials by exploring and comparing the properties of a broad range of materials. They should find out about how chemists create new materials, for example, Spencer Silver, who invented the glue for sticky notes or Ruth Benerito, who invented wrinkle-free cotton. Children should explore how materials are made and the importance of recycling materials on the environment. Children might work scientifically by: carrying out tests to answer questions, for example, 'Which materials would be the most effective for making a warm jacket, for wrapping ice cream to stop it melting, or for making blackout curtains?' They might compare materials in order to make a switch in a circuit. They could observe and compare the changes that take place, for example, when burning different materials or baking bread or cakes. They might research and discuss how chemical changes have an impact on our lives, for example, cooking, and discuss the creative use of new materials such as polymers, super-sticky and super-thin materials.	properties of materials hardness, solubility, transparency, conductivity (electrical and thermal) dissolve solution mixture separation solids, liquids and gases filtering, sieving and evaporating changes of state reversible irreversible acid burning bicarbonate of soda chemical reaction rusting evaporation filtering sieving melting

Big Ideas: Need to know the difference between a mixture and a solution and how to separate them. Changes can be either reversible or irreversible.

Lower Key Stage 2 - Anatomy		
Knowledge	**Know How**	**Key Vocabulary**
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 Children understand the functions of the respiratory system	Children should be introduced to the main body parts associated with the digestive and respiratory system and explore questions that help them to understand their special functions. Children might work scientifically by: comparing the teeth of carnivores and herbivores, and suggesting reasons for differences; finding out what damages teeth and how to look after them. They might draw and discuss their ideas about the digestive system and compare them with models or images.	digestive system mouth, tongue, teeth, oesophagus, stomach and small and large intestine incisor canine molar teeth food chain producer predator prey carnivore herbivore omnivore
Big Ideas: Different types of teeth have different functions. Every food chain starts with a producer. Individual parts of the digestive system have specific functions.		

Upper Key Stage 2 – Separating mixtures		
Knowledge	**Know How**	**Key Vocabulary**
Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution	They should explore reversible changes, including, evaporating, filtering, sieving, melting and dissolving, recognising that melting and dissolving are different processes.	properties of materials hardness, solubility, transparency, conductivity

Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating 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.	Children should explore changes that are difficult to reverse, for example, burning, rusting and other reactions, for example, vinegar with bicarbonate of soda. They should find out about how chemists create new materials, for example, Spencer Silver, who invented the glue for sticky notes or Ruth Benerito, who invented wrinkle-free cotton. **Note:** Children are not required to make quantitative measurements about conductivity and insulation at this stage. It is sufficient for them to observe that some conductors will produce a brighter bulb in a circuit than others and that some materials will feel hotter than others when a heat source is placed against them. Safety guidelines should be followed when burning materials. Children might work scientifically by: carrying out tests to answer questions, for example, 'Which materials would be the most effective for making a warm jacket, for wrapping ice cream to stop it melting, or for making blackout curtains?' They might compare materials in order to make a switch in a circuit. They could observe and compare the changes that take place, for example, when burning different materials or baking bread or cakes. They might research and discuss how chemical changes have an impact on our lives, for example, cooking, and discuss the creative use of new materials such as polymers, super-sticky and super-thin materials.	(electrical and thermal) dissolve solution mixture separation solids, liquids and gases filtering, sieving and evaporating changes of state reversible irreversible acid burning bicarbonate of soda chemical reaction rusting evaporation filtering sieving melting
Big Ideas: Need to know the difference between a mixture and a solution and how to separate them. Changes can be either reversible or irreversible.		

Upper Key Stage 2 – Diet and lifestyle		
Knowledge	**Know How**	**Key Vocabulary**
Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function	Children should build on their learning from years 3 and 4 about the main body parts and internal organs (skeletal, muscular and digestive system) to	circulatory system heart blood vessels artery

Describe the ways in which nutrients and water are transported within animals, including humans.	explore and answer questions that help them to understand how the circulatory system enables the body to function. Children should learn how to keep their bodies healthy and how their bodies might be damaged – including how some drugs and other substances can be harmful to the human body. Children might work scientifically by: exploring the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health.	vein oxygenated deoxygenated blood cells white blood cells Red blood cells plasma plateletsa diet exercise drugs medicines lifestyle health(y)
Big Ideas: When drugs can be medicines and when they can be harmful. Linked to PHSE and healthy lifestyles. All the systems in the body are interlinked. Diet, exercise, anxiety can affect you heart rate. Blood transports oxygen, nutrients, anti-bodies. Blood is made in the bones. The heart is a muscle.		

Upper Key Stage 2 - Heat		
Knowledge	**Know How**	**Key Vocabulary**
Children understand what happens when you heat particles including expansion of a material Children understand thermal equilibrium and how heat passes between particles Children understand thermal conductors and insulators	Children should build a more systematic understanding of materials by exploring and comparing the properties of a broad range of materials. Children should explore what happens to materials when heated and how we can prevent items from being heated. **Note:** Children are not required to make quantitative measurements about conductivity and insulation at this stage. It is sufficient for them to observe that some conductors will produce a brighter bulb in a circuit than others and that some materials will feel hotter than others when a heat source is placed against them. Safety guidelines should be followed when burning materials. Children might work scientifically by: carrying out tests to answer questions, for example, 'Which materials would be the most effective for making a warm jacket, for wrapping ice cream to stop it melting, or for making blackout	properties of materials hardness, solubility, transparency, conductivity (electrical and thermal) dissolve solution mixture separation solids, liquids and gases filtering, sieving and evaporating

	curtains?' They might compare materials in order to make a switch in a circuit. They could observe and compare the changes that take place, for example, when burning different materials or baking bread or cakes. They might research and discuss how chemical changes have an impact on our lives, for example, cooking, and discuss the creative use of new materials such as polymers, super-sticky and super-thin materials.	changes of state reversible irreversible acid burning bicarbonate of soda chemical reaction rusting evaporation filtering sieving melting
Big Ideas: Need to know the difference between a mixture and a solution and how to separate them. Changes can be either reversible or irreversible.		

Upper Key Stage 2 - Sustainability		
Knowledge	**Know How**	**Key Vocabulary**
Children understand what everyday materials are made of Children understand the life cycle of materials and why recycling is important Children understand what happens to materials (fuels) when they are burnt Children understand the concept of global warming and climate change	Children should explore how materials are use and reused or recycled. Children should explore the impact of material use including burning of materials and the impact it has on the environment. Children might work scientifically by: carrying out tests to answer questions, for example, 'Which materials would be the most effective for making a warm jacket, for wrapping ice cream to stop it melting, or for making blackout curtains?' They might compare materials in order to make a switch in a circuit. They could observe and compare the changes that take place, for example, when burning different materials or baking bread or cakes. They might research and discuss how chemical changes have an impact on our lives, for example, cooking, and discuss the creative use of new materials such as polymers, super-sticky and super-thin materials.	properties of materials hardness, solubility, transparency, conductivity (electrical and thermal) dissolve solution mixture separation solids, liquids and gases filtering, sieving and evaporating changes of state reversible irreversible acid

		burning bicarbonate of soda chemical reaction rusting evaporation filtering sieving melting
Big Ideas: Need to know the difference between a mixture and a solution and how to separate them. Changes can be either reversible or irreversible.		

Upper Key Stage 2 – Physical and Chemical changes		
Knowledge	**Know How**	**Key Vocabulary**
Children know what is happening in a state change Children understand physical and chemical changes and the differences between them Children understand chemical reactions	Children should explore changes of state both physical and chemical. Children might work scientifically by: grouping and classifying a variety of different materials; exploring the effect of temperature on substances such as chocolate, butter, cream (for example, to make food such as chocolate crispy cakes and ice-cream for a party). They could research the temperature at which materials change state, for example, when iron melts or when oxygen condenses into a liquid. They might observe and record evaporation over a period of time, for example, a puddle in the playground or washing on a line, and investigate the effect of temperature on washing drying or snowmen melting.	states of matter solid liquid gas properties particles evaporation solidification condensation the water cycle melting
Big Ideas: Materials can change state. Materials can exist in all three states. The relative density of a material determines its state.		

Upper Key Stage 2 – Reproductive cycles		
Knowledge	**Know How**	**Key Vocabulary**
Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird	Children should study and raise questions about their local environment throughout the year. They should observe life-cycle changes in a variety of living things, for example, plants in the vegetable garden or flower	life cycle plant animal

Describe the life process of reproduction in some plants and animals.	border, and animals in the local environment. They should find out about the work of naturalists and animal behaviourists, for example, David Attenborough and Jane Goodall. Children should find out about different types of reproduction, including sexual and asexual reproduction in plants, and sexual reproduction in animals. Children might work scientifically by: observing and comparing the life cycles of plants and animals in their local environment with other plants and animals around the world (in the rainforest, in the oceans and in desert areas), asking pertinent questions and suggesting reasons for similarities and differences. They might try to grow new plants from different parts of the parent plant, for example, seeds, stem and root cuttings, tubers, bulbs. They might observe changes in an animal over a period of time (for example, by hatching and rearing chicks), comparing how different animals reproduce and grow.	mammal insect amphibian fish reptile sexual reproduction asexual reproduction habitat ecosystem environment rainforest oceans desert Metamorphosis
Big Ideas: Different classifications of animals have different life cycles and different methods of reproduction. Babies may look different to their adults		

Upper Key Stage 2 – Particles and chemical reactions		
Knowledge	**Know How**	**Key Vocabulary**
Children understand how particles behave in liquids and gasses. Children understand how particles look in a pure substance Understand what happens particles during dissolving Understand how mixtures can be separated Understand when a chemical reaction has taken place	hey should explore reversible changes, including, evaporating, filtering, sieving, melting and dissolving, recognising that melting and dissolving are different processes. Children should explore changes that are difficult to reverse, for example, burning, rusting and other reactions, for example, vinegar with bicarbonate of soda. They should find out about how chemists create new materials, for example, Spencer Silver, who invented the glue for sticky notes or Ruth Benerito, who invented wrinkle-free cotton. Children might work scientifically by: carrying out tests to answer questions, for example, 'Which materials would be the most effective for making a warm jacket, for wrapping ice cream to stop it melting, or for making blackout	properties of materials hardness, solubility, transparency, conductivity (electrical and thermal) dissolve solution mixture separation solids, liquids and gases

Understand what happens to particles during burning	curtains?' They might compare materials in order to make a switch in a circuit. They could observe and compare the changes that take place, for example, when burning different materials or baking bread or cakes. They might research and discuss how chemical changes have an impact on our lives, for example, cooking, and discuss the creative use of new materials such as polymers, super-sticky and super-thin materials.	filtering, sieving and evaporating changes of state reversible irreversible acid burning bicarbonate of soda chemical reaction rusting evaporation filtering sieving melting
Big Ideas: Need to know the difference between a mixture and a solution and how to separate them. Changes can be either reversible or irreversible.		

Upper Key Stage 2 – Electrical circuits		
Knowledge	**Know How**	**Key Vocabulary**
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 Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit	Children should construct simple series circuits, to help them to answer questions about what happens when they try different components, for example, switches, bulbs, buzzers and motors. They should learn how to represent a simple circuit in a diagram using recognised symbols. Children should construct simple series circuits, trying different components, for example, bulbs, buzzers and motors, and including switches, and use their circuits to create simple devices. Children should draw the circuit as a pictorial representation. **Note:** The Curriculum states that children are expected to learn only about series circuits, not parallel circuits. However it is helpful to learn about parallel circuits. Children should be taught to take the necessary precautions for working safely with electricity.	brightness volume cell battery series circuit parallel circuit component symbol switches buzzers lamps

Recognise some common conductors and insulators, and associate metals with being good conductors. Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches Use recognised symbols when representing a simple circuit in a diagram.	Children might work scientifically by: systematically identifying the effect of changing one component at a time in a circuit; designing and making a set of traffic lights, a burglar alarm or some other useful circuit.	
Big Ideas: The voltage directly affects the output of the component. A circuit diagram can be represented with symbols to make it easily replicated and understood.		

Upper Key Stage 2 - Magnetism		
Knowledge	**Know How**	**Key Vocabulary**
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 repel each other and attract some materials and not others	Children should observe that magnetic forces can act without direct contact, unlike most forces, where direct contact is necessary (for example, opening a door, pushing a swing). They should explore the behaviour and everyday uses of different magnets (for example, bar, ring, button and horseshoe). Children might work scientifically by: comparing how different things move and grouping them; raising questions and carrying out tests to find out how far things move on different surfaces and gathering and recording data to find answers their questions; exploring the strengths of different magnets and finding a fair way to compare them; sorting materials into those that are magnetic and those that are not; looking for	forces push pull attract repel friction magnet(ic) bar magnet ring magnet button magnet horseshoe magnet contact

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.	patterns in the way that magnets behave in relation to each other and what might affect this, for example, the strength of the magnet or which pole faces another; identifying how these properties make magnets useful in everyday items and suggesting creative uses for different magnets.	poles/polarity
Big Ideas: Only metals containing iron are magnetic. Magnetism is a type of force		

Upper Key Stage 2 - Energy		
Knowledge	**Know How**	**Key Vocabulary**
Children understand how energy is stored Children understand how energy is transferred Children understand how energy is used efficiently Children understand how energy is used to power devices Children understand how time, speed and distance relate Children understand kinetic energy	Children should explore energy use and transfer Children should explore how energy is used to power human's lives and how efficiency is achieved Children should have opportunity to conduct experiments into time, speed and distance.	Efficient Power Kinetic Energy Potential Gravitational Chemical Elastic Heat

Upper Key Stage 2 - Cells		
Knowledge	**Know How**	**Key Vocabulary**
Understand the difference in living and non-living things Understand the main organ systems in the body. Understand the role of cells in the body Understand the difference in animal and plant cells Understand the role of specialised cells	Explore organ systems in the body and how they impact upon our health Explore the role of cells in animals and plants	circulatory system heart blood vessels artery vein oxygenated deoxygenated blood cells white blood cells Red blood cells plasma platelets diet exercise drugs medicines lifestyle health(y)
Big Ideas: When drugs can be medicines and when they can be harmful. Linked to PHSE and healthy lifestyles. All the systems in the body are interlinked. Diet, exercise, anxiety can affect you heart rate. Blood transports oxygen, nutrients, anti-bodies. Blood is made in the bones. The heart is a muscle.		

Upper Key Stage 2 – Humans and Animals over time		
Knowledge	**Know How**	**Key Vocabulary**
Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago	Children should find out more about how living things on earth have changed over time. They should be introduced to the idea that characteristics are passed from parents to their offspring, for instance by considering different breeds of dogs, and what happens when, for example, Labradors are crossed with poodles.	fossils offspring characteristics breed of animal evolution inheritance adapt(ion) environment

Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. Understand different organisms have lived over time Understand the impact humans have had on animal kingdoms	They should also appreciate that variation in offspring over time can make animals more or less able to survive in particular environments, for example, by exploring how giraffes' necks got longer, or the development of insulating fur on the arctic fox. Children might find out about the work of palaeontologists such as Mary Anning and about how Charles Darwin and Alfred Wallace developed their ideas on evolution. **Note:** At this stage, children are not expected to understand how genes and chromosomes work. Children might work scientifically by: observing and raising questions about local animals and how they are adapted to their environment; comparing how some living things are adapted to survive in extreme conditions, for example, cactuses, penguins and camels. They might analyse the advantages and disadvantages of specific adaptations, such as being on two feet rather than four, having a long or a short beak, having gills or lungs, tendrils on climbing plants, brightly coloured and scented flowers.	palaeontologist Mary Anning Charles Darwin Alfred Wallace Mutation
Big Ideas: Evolution is driven by need to need to survive in your environment. There is competition for finite resources. You inherit characteristics from your parents and this is supplemented by your environmental and cultural experiences.		

Science progression

	EYFS	KS1	Lower KS2	Upper KS2
Seasons and weather	Children know the features of familiar places, home, school, their local area, for example weather, seasons, human and natural resources. Children know that things change over time including life cycles of plants and animals	• observe changes across the four seasons • observe and describe weather associated with the seasons and how day length varies		
Materials	Children know the properties of familiar objects Children know the properties of familiar 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 • 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 Rocks	• 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,	• 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

			and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda	
Sound	Children know simple reasons why things occur	• 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 source increases	Understand how different sounds are produced Understand pitch, frequency and amplitude. Understand how we use sound Understand devices that use sound	
Plants	Children know the features of animals and plants in their locality and other regions studied including appearance, diet and habitat Children know that things change over time including life cycles of plants and animals	• 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 • 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	• 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 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	
Animals	Children know the features of animals and plants in their locality	• explore and compare the difference between things that are	• construct and interpret a variety of food chains, identifying producers, predators and prey	• describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird

	and other regions studied including appearance, diet and habitat Children know that things change over time including life cycles of plants and animals	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 the basic needs of different kinds of animals and plants, and how they depend on each other • identify and name a variety of plants and animals in their habitats, including micro-habitats • 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	• 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 dangers to living things	• describe the life process of reproduction in some plants and animals • describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals • give reasons for classifying plants and animals based on specific characteristics
Humans	Children know the features of animals and plants in their locality and other regions studied including appearance, diet and habitat Children know that things change over time including life cycles of plants and animals	• 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, eating the right amounts of different types of food, and hygiene	• 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	• 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
Light		• recognise that they need light in order to see things and that the dark is the absence of light • notice that light is reflected from surfaces • recognise that light from the sun can be dangerous and that there are ways to protect their eyes	• 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 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	

		• recognise that shadows are formed when the light from a light source is blocked by a solid object • find patterns in the way that the size of shadows changes	• use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them	
Space		• describe the movement of the Earth, and other planets, relative to the Sun • 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		
Energy				Children understand how energy is stored Children understand how energy is transferred Children understand how energy is used efficiently Children understand how energy is used to power devices Children understand how time, speed and distance relate Children understand kinetic energy
Magnetism				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 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.
Sustainability				Children understand what everyday materials are made of Children understand the life cycle of materials and why recycling is important Children understand what happens to materials (fuels) when they are burnt Children understand the concept of global warming and climate change