




Curriculum coverage and progression

SUBJECT: Science


Year 1

Science Topic	Exploration leading to Fair-test/pattern seeking	Observation over time	Classification and identification
Plants		Observe the growth of flowers and vegetables they have planted. Keep records of how plants have changed over time, for example the leaves falling off trees and buds opening	Compare and contrast familiar plants; describe how they were able to identify and group them. Compare and contrast how different plants change and what they have found out about different plants
Animals, including humans			Compare and contrast animals. Describe how they identify and group them. Group animals according to what they eat. Use senses to compare different textures sounds and smells
Everyday materials	Test to explore questions such as: 'What is the best material for an umbrella? ... for lining a dog basket?... for curtains?... for a bookshelf ?... for a gymnast's leotard ?		Group materials according to their properties such as: hard/soft; stretchy/stiff; shiny/dull; rough smooth; bendy/not bendy; waterproof/not waterproof and absorbent/not absorbent; opaque/transparent.
Seasonal Changes		Observe and make tables and charts about weather; and making displays of what happens in the world around them, including day length, as the seasons change.	

Year 1- Plants


National Curriculum Objectives <ul style="list-style-type: none">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.Identify and name the roots, truck, branches and leaves of trees		Sticky knowledge <ul style="list-style-type: none">Plants grow from seeds/bulbsPlants need light and water to grow and survive.Plants are importantWe can eat lots of plants		Vocabulary <p>Evergreen, deciduous, garden, Wild, stem, Flower, Bulb, Seed, Root, Branch, Trunk, leaves</p>	Key Scientists <p>Beatrix Potter</p>
Prior Learning		Key Questions (s):		Year 2 Learning (Next Stage of Study)	
In EYFS children should: <ul style="list-style-type: none">Carry out observations of plantsKnow some names of plants, trees, and flowersMay be able to name and describe different plants, trees, and flowersShow some care for their world around them		<ul style="list-style-type: none">How do plants grow?What do plants need to grow?Do all plants need water?Are all plants green?Why do seeds look different?Can plants grow as big in the shade?What is the biggest/smallest (ect) tree/flower/plant on the planet?		In Year 2 children will: <ul style="list-style-type: none">Observe and describe how seeds and bulbs grow into mature plants.Find out and describe how plants need water, light, and warmth to grow and stay healthy.	
Teaching Ideas (Working Scientifically)					
Comparative tests	Identify & classify	Observation over time	Pattern Seeking	Research	
What type of compost grows the tallest sunflower?	How can we sort the leaves that we collected on our walk?	How does a daffodil blub change over the year?	Do trees with bigger leaves lose their leaves first in autumn?	What are the most common British plants and where can we find them?	
Which tree has the biggest leaves?		How does my sunflower change each week?	Is there a pattern in where we find moss growing in the school grounds?	How did Beatrix Potter help our understanding of mushrooms and toadstools?	
		How does the oak tree change over the year?			

Year 1- Animals, including Humans


National Curriculum Objectives <ul style="list-style-type: none">Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.Identify and name a variety of common animals that are carnivores, herbivores and omnivores		Sticky knowledge <ul style="list-style-type: none">There are many different animals with different characteristics.Animals have senses to help individuals survive. When animals sense things they are able to respond.Animals need food to survive.Animals need a variety of food to help them grow, repair their bodies, be active and stay healthy.		Vocabulary Elbow, teeth, toes, Knee, nose, eye, thumb, foot, leg, fingers, hand, shoulder, Mouth, ear, neck, head, smell, taste, touch, hearing, sight, omnivore, herbivore, carnivores, reptiles, Mammals, fish, birds, Amphibians	Key Scientists Chris Packham (animal conservationist)
Prior Learning		Key Questions (s):		Year 2 Learning (Next Stage of Study)	
In EYFS children should: <ul style="list-style-type: none">Have knowledge of identifying different parts of their body.Have some understanding of healthy food and the need for variety in their diets.Show care and concern for living things.Know the effects exercise has on their bodies.Have some understanding of growth and change.Can talk about things they have observed including animals		<ul style="list-style-type: none">What do animals eat?Do all animals eat the same food?Which of our senses is the most accurate at identifying food?Do all animals hunt?Why are animals different colours and patterns?		In Year 2 children will: <ul style="list-style-type: none">Know that animals including humans have offspring which grow into adultsKnow the basic stages in a life cycle for animals including humans.Find out 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.	
Teaching Ideas (Working Scientifically)					
Comparative tests	Identify & classify	Observation over time	Pattern Seeking		Research
Is our sense of smell better when we cannot see?	How can we organise all the zoo animals? What are the names for all the parts of our bodies?	How does my height change over the year?	Do you get better at smelling as you get older?		



Year 1 – Energy (Seasons & How They Change)

National Curriculum Objectives <ul style="list-style-type: none">• Observe changes across the four seasons• Observe and describe weather associated with the seasons and how day length varies		Sticky knowledge <ul style="list-style-type: none">• Weather can change• There are lots of different types of weather: Rain, Sun, Cloud, Wind, Snow, etc• Days are longer and hotter in the summer• Days are shorter and colder in the winter• There are four seasons: Spring, Summer Autumn & Winter			Vocabulary <p>Seasons, Spring Summer Autumn, Windy, Sunny Overcast, Snow Rain, Temperature</p>	Key Scientists <p>Dr Steve Lyons (Extreme Weather)</p>
Prior Learning <p>In EYFS, children should:</p> <ul style="list-style-type: none">• Have developed an understanding of change.• Observed and explained why certain things may occur• Looked closely at similarities, differences, patterns and change.• Commented and questioned about the place they live or the natural world.		Key Questions (s): <ul style="list-style-type: none">• Why do more frequent days of rain saturate the ground?• How long does it take for the ground to dry after it has been raining?• Does more rain take longer to dry?• Do countries with higher temperatures have less rain?• How does rainfall and temperature change over time in our school grounds?• Which leaf is the strongest/best shade cover/best at directing water?• What do you notice about different leaves?• What purpose do leaves serve for a tree?• Why do you think leaves turn brown in Winter?• What colours can we find outside?• What effect does rain have on the environment?• What would happen if there was too much rain?• What would happen if there wasn't enough rain?			Year 3 Learning (Next Stage of Study) <p>In Year 3 children will:</p> <ul style="list-style-type: none">• 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 a solid object.• Find patterns in the way that the sizes of shadows change.	
Teaching Ideas (Working Scientifically)						
Comparative tests	Identify & classify	Observation over time	Pattern Seeking		Research	
In which season does it rain the most?	How could you organise all the objects in the solar system into groups?	How does the colour of a UV bead change over the day?	Does the wind always blow the same way?		Are there plants that are in flower in every season?	

Year 1 – Materials

National Curriculum Objectives <ul style="list-style-type: none">Distinguish between an object and the material from which it is made.Identify and name a variety of everyday materials, including wood, metal, plastic, glass, water and rock,Describe the simple physical properties of a variety of everyday materials.Compare and group together a variety of everyday materials based on their simple properties		Sicky knowledge <ul style="list-style-type: none">There are many different materials that have different describable and measurable properties.Materials that have similar properties are grouped into metals, rocks, fabrics, wood, plastic and ceramics.The properties of a material determine whether they are suitable for a purpose.	 Vocabulary Hard Soft, Stretchy Stiff, Shiny Dull, Rough Smooth, Bendy/not bendy Waterproof/not waterproof Absorbent, Opaque	Key Scientists William Addis (Toothbrush Inventor)
Prior Learning In EYFS children should: <ul style="list-style-type: none">be able to ask questions about the place they live.talk about why things happen and how things work.discuss the things they have observed such as natural and found objects.manipulates materials to achieve a planned effect.		Key Questions (s): It is recommended that materials to be taught three times through KS1. Find example below. Buildings <ul style="list-style-type: none">Which rocks are the least crumbly? Toys <ul style="list-style-type: none">Which fabric would make the softest blanket? Clothing & Materials <ul style="list-style-type: none">Which material could be used make a waterproof hat for the teacher when she/he is on the playground at playtime?	Year 2 Learning (Next Stage of Study) In Year 2 children will: <ul style="list-style-type: none">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 shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	
Teaching Ideas (Working Scientifically)				
Comparative tests	Identify & classify	Observation over time	Pattern Seeking	Research
Which materials are the most flexible?	We need to choose a material to make an umbrella so we need to find materials that are waterproof?	What happens to materials over time if we bury them in the ground?	Is there a pattern in the types of materials that are used to make objects in a school?	How are bricks made?




Curriculum coverage and progression

SUBJECT: Science


Year 2

Science Topic	Exploration leading to Fair-test/pattern seeking	Observation over time	Classification and identification
Living things and their habitats	Describing the conditions in different habitats and micro-habitats and finding out how the conditions affect the number and type(s) of plants and animals that live there		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 knew where to place things
Plants	Setting up a comparative test to show that plants need light and water to stay healthy	Use the local environment throughout the year to observe how different plants grow. Observing and recording with some accuracy, the growth of a variety of plants as they change over time from a seed or bulb, or observing similar plants at different stages of growth	
Animals, including humans	Raise questions about what things animals need for survival and what humans need to stay healthy ; and suggesting ways to find answers to their questions	Observe through video or first- hand observation or measurement how different animals including humans, grow	
Uses of everyday materials			Observe closely, identifying and classifying the uses of different materials, and recording their observations.


Year 2- Plants

National Curriculum Objectives <ul style="list-style-type: none">Observe and describe how seeds and bulbs; grow into mature plants.Find out and describe how plants need water, light and warmth to grow and stay healthy.		Sticky knowledge <ul style="list-style-type: none">Plants grow from seeds/bulbsPlants need light, water and warmth to grow and survivePlants are importantWe need plants to survive (to clean air, to eat)We can eat different parts of the plants (leaves, stems, roots, seeds, fruit)			Vocabulary Sunlight, trunk, Branch, root, Seed, Bulb, flower, stem, wild, garden, grow, deciduous, evergreen, observe, compare, record, temperature, predict, measure, diagram, germinate, warmth, leaves	Key Scientists Agnes Arber Allan Tichmarsh
Prior Learning		Key Questions (s):		Year 3 Learning (Next Stage of Study)		
In Year 1 children should: <ul style="list-style-type: none">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.Identify and name the roots, truck, branches and leaves of trees		<ul style="list-style-type: none">Do cress produce seeds, how could we find out?Do all plants produce flowers and seeds?What is different between freshly cut and planted flowers?Do plants flower all year round?What are flowers for?What happens to a plant after it has produced seeds?		In Year 3 children will: <ul style="list-style-type: none">Identify and describe the functions of different parts of the flowering plant: roots, stem/trunk/leaves and flowersExplore the part flowers play in a flowering plant’s life cycle, including pollination, seed formation and seed dispersalExplain the requirements of plants for life and growth (air, light, water, nutrients from soil, room to grow) and how they vary between plantsKnow the way in which water is transported between plants		
Teaching Ideas (Working Scientifically)						
Comparative tests	Identify & classify	Observation over time	Pattern Seeking		Research	
Do cress seeds grow quicker outside or inside?	How can we identify the trees that we observed on our tree hunt?	What happens to my bean after I have planted it?	Do bigger seeds grow in to bigger plants?		How does a cactus survive in a desert with no water?	


Year 2 – Living Things and their Habitats

National Curriculum Objectives <ul style="list-style-type: none">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.Describe how animals obtain their food from plants and other animals using the idea of a simple food chain and identify and name the different sources of food.		Sticky knowledge <ul style="list-style-type: none">Some things are living some were once living but now dead and some things never lived.There is variation between living things.Different animals and plants live in different places. Living things are adapted to survive in different habitats.Environmental change can affect plants and animals that live there.		Vocabulary <p>Living dead Never, alive Habitats Micro-habitats Food, Food chain Leaf, litter Shelter, Seashore Woodland, Ocean Rainforest Conditions, Desert Damp, shade</p>	Key Scientists <p>Terry Nutkins</p>
Prior Learning		Key Questions (s):		Year 4 Learning (Next Stage of Study)	
In EYFS children should: <ul style="list-style-type: none">Be able to comment and question about the place they live or the natural world.Shows care and concern for living things and the environment.Can talk about things they have observedNotices features of objects in their environment.Comments and asks questions about their familiar world.		<ul style="list-style-type: none">How to animals eat?Do all animals eat the same thing?Which animals hunt and which animals are hunted? Why?What animals live in our school environment?How are animals and plants ‘adapted’ to live in their habitats?Why do animals and plants like to live in different places?How do seasons affect our animals and plants?Which animals hibernate and why?Why do snails hibernate but slugs do not?How do habitats change over our school year?		In Year 4 children will: <ul style="list-style-type: none">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.Know and label the features of a riverRecognise that environments can change and that this can sometimes pose danger to living things.	
Teaching Ideas (Working Scientifically)					
Comparative tests	Identify & classify	Observation over time	Pattern Seeking	Research	
Which pets are the easiest to look after? Is there the same level of light in the everygreen wood compared with the deciduous wood?	How would you group these plants and animals based on what habitat you would find them in?	How does the school pond change over the year?	What conditions do woodlice prefer to live in? Which habitats do worms prefer where can we find the most worms?	How are the animals in Australia different to the ones that we find in Britain? How does the habitat of the Arctic compare with the habitat of the rainforest?	


Year 2- Animals, including Humans

National Curriculum Objectives <ul style="list-style-type: none">Know that animals including humans have offspring which grow into adultsKnow the basic stages in a life cycle for animals including humans.Find out 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.		Sticky knowledge <ul style="list-style-type: none">Animals move in order to survive.Different animals move in different ways to help them survive.Exercise keeps animal's bodies in good condition and increases survival chances.All animals eventually die.Animals reproduce new animals when they reach maturity.Animals grow until maturity and then do not grow any larger.		Vocabulary Living, dead, Never, alive Habitats micro-Habitats, Food Food Chain, Leaf Litter, Shelter Seashore, Woodland, Ocean Rainforest, conditions Desert Damp Shade	Key Scientists Steve Irwin (crocodile hunter)
Prior Learning In Year 1 children should: <ul style="list-style-type: none">Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.Identify and name a variety of common animals that are carnivores, herbivores and omnivores		Key Questions (s): <ul style="list-style-type: none">How long should my pets live for?Do all animals grow and live the same way?Do bigger animals live longer?Why are we all different heights?How and why do we grow and change?		Year 3 Learning (Next Stage of Study) In Year 3 children will: <ul style="list-style-type: none">Identify that animals including humans need the right types and amount of nutrition and they cannot make their own food; they get their nutrition from what they eat.Know how nutrients, water and oxygen are transported within animals and humans.Know about the importance of a nutritious, balanced diet.Identify that humans and some other animals have skeletons and muscles for support, protection and movement.	
Teaching Ideas (Working Scientifically)					
Comparative tests Do amphibians have more in common with reptiles or fish? Do bananas make us run faster?	Identify & classify Which offspring belongs to which animal? How would you group things to show which are living dead or have never been alive?	Observation over time How does a tadpole change over time? How much food and drink do I have over a week?	Pattern Seeking Which age group of children wash their hands the most in a day?		Research What food do you need in a healthy diet and why? What do you need to do to look after a pet dog/cat/lizard and keep it healthy?

Year 2 – Forces

National Curriculum Objectives There are no specified NC objectives for forces in KS1		Sticky knowledge <ul style="list-style-type: none">• Pushing and pulling can make things move faster or slower.• Pushing and pulling can make things move or stop.• Things can move in different ways.• Larger masses take bigger pushes and pulls to move or stop them.• Pushing and pulling can change the shapes of things.• Bigger pushes and pulls have bigger effects.			Vocabulary Force, push Pull, surface Attract, repel compass	Key Scientists The Wright Brothers (Aeroplane)
Prior Learning In EYFS, children should: <ul style="list-style-type: none">• know about similarities and differences in relation to places/objects/materials and living things.• talk about the features of their own immediate environment and how environments could vary from one another.• make observations of animals and plants, explain why some things occur, and talk about changes.		Key Questions (s): <ul style="list-style-type: none">• How can we move objects?• How can we change the way an object moves?• How does a material affect how fast a ball rolls down a slope?• How does the length/steepness of a slope affect how far a ball/car/tin will roll off the end?• How does length of an elastic band affect how elastic it is?• Which sock is the most elastic?		Year 3 Learning (Next Stage of Study) In Year 3 children will: <ul style="list-style-type: none">• Compare how things move on different surfaces.• Know how a simple pulley works and use making lifting an object simpler• Notice that some forces need contact between two objects but magnetic forces can act at a distance.• Observe how magnets attract and repel each other and attract some materials and not others.• Compare and group together a variety of everyday materials based on whether they are attracted to a magnet and identify some magnetic materials.• Describe magnets as having two poles.• Predict whether two magnets will attract or repel each other depending on which poles are facing.		
Teaching Ideas (Working Scientifically)						
Comparative tests		Identify & classify	Observation over time	Pattern Seeking		Research
Which materials would be best for the roof of the little pig's house?		Which materials will float and which will sink?	Would a paper boat float forever?	How does changing the force change the speed of a toy car?		Why do objects float or sink?

Year 2 – Materials

National Curriculum Objectives <ul style="list-style-type: none">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 shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.		Sticky knowledge <ul style="list-style-type: none">Materials can be changed by physical force 	Vocabulary <p>Waterproof, Fabric Rubber, Cars Rock, Paper Cardboard, Wood Metal, Plastic Glass, Brick Twisting, Squashing Bending, Matches Cans, Spoons</p>	Key Scientists <p>William Addis (Toothbrush Inventor)</p>
Prior Learning		Key Questions (s):	Year 3 Learning (Next Stage of Study)	
In Year 1 children should: <ul style="list-style-type: none">Distinguish between an object and the material from which it is made.Identify and name a variety of everyday materials, including wood, metal, plastic, glass, water and rock,Describe the simple physical properties of a variety of everyday materials.Compare and group together a variety of everyday materials based on their simple properties		It is recommended that materials to be taught three times through KS1. Aim is to investigate a couple of classes of materials and properties in each topic so children get a depth of experience in each topic. Please find an example below. Buildings <ul style="list-style-type: none">Which rocks are the least crumbly? Toys <ul style="list-style-type: none">Which fabric would make the softest blanket? Clothing & Materials <ul style="list-style-type: none">Which material could be used to make a waterproof hat for the teacher when she/he is on the playground at playtime?	In Year 3 children will: <ul style="list-style-type: none">Compare and group together different kinds of rocks based on their appearance and simple physical propertiesDescribe in simple terms how fossils are formed when things that have lived are trapped within rockRecognise that soils are made from rocks and organic matter.	
Teaching Ideas (Working Scientifically)				
Comparative tests	Identify & classify	Observation over time	Pattern Seeking	Research
Which shapes make the strongest paper bridge?	Which materials will float and which will sink?	How long do bubble bath bubbles last for?	How do materials change with heat?	How have the materials we use changed over time?




Curriculum coverage and progression

SUBJECT: Science


Year 3

Science Topic	Exploration leading to Fair-test/pattern seeking	Observation over time	Classification and identification
Plants	Compare the effect of different factors on plant growth, for example the amount of light, the amount of fertiliser.	Discover how seeds are formed by observing the different stages of plant cycles over a period of time; looking for the patterns in the structure of seeds that relate to how they are dispersed. Observe how water is transported in plants, for example putting cut, white carnations into coloured water and observing how water travels up the stem to the flowers	
Animals, including humans			Identify and group animals with and without skeletons and observing and comparing their movement. Compare and contrast the diets of different animals and decide on ways of grouping them according to what they eat.
Rocks	What happens when rocks are rubbed together or what changes occur when they are in water	Observe rocks exploring how and why they might have changed over time.	Using a hand lens or microscope to help identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them. Explore different soils and identify similarities and differences between them
Light	Look for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes.		
Forces and magnets	Compare how different things move on different surfaces and gathering and recording data to find answers to their questions. Exploring the strength of different magnets and finding a fair way to compare them. Looking for patterns in the way that magnets behave in relation to each other and what might effect this e.g. poles		Compare and group things by how they move. Sort materials into those that are magnetic and those that are not.


Year 3- Plants

National Curriculum Objectives <ul style="list-style-type: none">Identify and describe the functions of different parts of the flowering plant: roots, stem/trunk/leaves and flowersExplore the part flowers play in a flowering plant’s life cycle, including pollination, seed formation and seed dispersalExplain the requirements of plants for life and growth (air, light, water, nutrients from soil, room to grow) and how they vary between plantsKnow the way in which water is transported between plants		Sticky knowledge <ul style="list-style-type: none">Plants are producers, they make their own foodTheir leaves absorb sunlight and carbon dioxidePlants have roots, which provide support and draw water from the soilFlowering plants have specific adaptations which help it to carry out pollination, fertilisation and seed productionSeed dispersal improves a plants changes of successful reproductionSeeds/bulbs require the right conditions to germinate and growSeeds contain enough food for the plant’s initial growth	 Vocabulary chlorophyll, photosynthesis, material, sugar, oxygen, Dioxide, Carbon, Seedling, growth, energy, flower, transportation, dispersal, pollination, reproduction, anchor, support, soil, nutrients, water, light, air	Key Scientists Jan Ingenhousz Joseph Banks
Prior Learning In Year 2 children should: <ul style="list-style-type: none">Observe and describe how seeds and bulbs; grow into mature plants.Find out and describe how plants need water, light and warmth to grow and stay healthy.		Key Questions (s): <ul style="list-style-type: none">How do plants reproduce?Do all flowers look the same?How do insects know which flowers to pollinate?Why do flowers smell?What do seeds do?Can a plant live without its leaves?Do grass/trees make flowers?What conditions are perfect for a seed to grow?Where do weeds come from?Who does the space between seeds affect how well they grow?Does seed size match plant size?Do plants take in water through their roots?How does water move through the plant?How do plants make their food?How does light affect plant growth?How does a plant get carbon dioxide?	Year 6 Learning (Next Stage of Study) In Year 6 children will: <ul style="list-style-type: none">Recognise that living things have changed over time and that fossils provide information about living thingsRecognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parentsIdentify how animals and plants are adapted to suit their environments in different ways, and that adaption can lead to evolution.	
Teaching Ideas (Working Scientifically)				
Comparative tests	Identify & classify	Observation over time	Pattern Seeking	Research
How does the length of the carnation stem affect how long it takes for the food colouring to dye the petals?	How many ways can you group our seed collection?	What happens to celery when it is left in a glass of coloured water?	What colour flowers do pollinating insects prefer?	How do flowers reproduce?


Year 3 - Animals, including Humans

National Curriculum Objectives <ul style="list-style-type: none">Identify that animals including humans need the right types and amount of nutrition and they cannot make their own food; they get their nutrition from what they eat.Know how nutrients, water and oxygen are transported within animals and humans.Know about the importance of a nutritious, balanced diet.Identify that humans and some other animals have skeletons and muscles for support, protection and movement.		Sticky knowledge <ul style="list-style-type: none">Different animals are adapted to eat different foods.Many animals have skeletons to support their bodies and protect vital organs.Muscles are connected to bones and move them when they contract.Movable joints connect bones		Vocabulary Nutrients, Nutrition carbohydrates Protein, Fats, Vitamins minerals, Water, Fibre, Skeleton Bones, Joints, Endoskeleton Exoskeleton, Hydrostatic Skeleton Vertebrates, Invertebrates muscles contract Relax	Key Scientists Adelle Davis Marie Curie
Prior Learning		Key Questions (s):		Year 4 Learning (Next Stage of Study)	
In Year 2 children should: <ul style="list-style-type: none">Know that animals including humans have offspring which grow into adultsKnow the basic stages in a life cycle for animals including humans.Find out 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.		<ul style="list-style-type: none">Why do we need a skeleton?What types of skeleton are there?Are all skeletons the same?Can something survive without a skeleton?What happens if we break a bone?How do we move?Are bones that are bigger, stronger?Why do we need joints?Why do muscles get tired?Can we 'break' muscles?		In Year 4 children will: <ul style="list-style-type: none">Describe the simple functions of the basic parts of the digestive system in humans.Identify the different types of teeth in humans and their simple functions.Construct and interpret a variety of food chains/identifying producers/predators and prey	
Teaching Ideas (Working Scientifically)					
Comparative tests	Identify & classify	Observation over time	Pattern Seeking		Research
How does the angle that your elbow/knee is bent affect the circumference of your upper arm/thigh?	How do the skeletons of different animals compare?	How does our skeleton change over time?	Do male humans have larger skulls than female humans?		Why do different types of vitamins keep us healthy and which foods can we find them in?


Year 3 – Materials

National Curriculum Objectives <ul style="list-style-type: none">• Compare and group together different kinds of rocks based on their appearance and simple physical properties• Describe in simple terms how fossils are formed when things that have lived are trapped within rock• Recognise that soils are made from rocks and organic matter.		Sticky knowledge <ul style="list-style-type: none">• There are different types of rock.• There are different types of soil.• Soil changes over time.• Different plants grow in different soils.• Fossils tell us what has happened before.• Fossils provide evidence.• Palaeontologists use Fossils to find out about the past.• Fossils provide evidence that living things have changed over time. 	Vocabulary <p>Rocks, Igneous Metamorphic, Sedimentary Anthropic, Permeable, Impermeable Chemical Fossil, Body fossil, Trace fossil Mary Anning Cast fossil, Mould fossil Replacement fossil, Extinct Organic Matter, Topsoil Sub soil, Base rock</p>	Key Scientists <p>Mary Anning (Discovery of Fossils)</p>
Prior Learning <p>In Year 2 children should:</p> <ul style="list-style-type: none">• 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 shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. <p>Pupils could also have some prior knowledge of rocks and what a fossil is.</p>		Key Questions (s): <ul style="list-style-type: none">• How are the soils different?• Which do you think has best drainage?• Which more likely to lead to flooding?• How many soil types have we found?• How might the soil be different in different countries?• What rock is best for a kitchen chopping board?• What types of rocks are there?• How do rocks change?• What would grow best in your soil?• Why do you think worms are important to the creation of soil?• How can we use composting to make our own soil?• Does it currently look like real soil?• How long do you think this process will take and why?• How are fossils created?• Why do fossils help us find out about historical events?• If you could fossilise an object, what would it be?	Year 4 Learning (Next Stage of Study) <p>In Year 4 children will:</p> <ul style="list-style-type: none">• Compare and group materials together, according to whether they are solids, liquids or gasses.• Observe that some materials change state when heated or cooled, and measure and research the temperature at which this happens in degrees Celsius.• Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. <p>In Year 6 children will:</p> <ul style="list-style-type: none">• Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.	
Teaching Ideas (Working Scientifically)				
Comparative tests	Identify & classify	Observation over time	Pattern Seeking	Research
How does adding different amounts of sand to soil affect how quickly water drains through it?	Can you use the identification key to find out the name of each of the rocks in your collection?	How does tumbling change a rock over time?	Is there a pattern in where we find volcanos on planet Earth?	Who was Mary Anning and what did she discover?

Year 3 – Forces and Magnetism

National Curriculum Objectives <ul style="list-style-type: none">• Compare how things move on different surfaces.• Know how a simple pulley works and use making lifting an object simpler• Notice that some forces need contact between two objects but magnetic forces can act at a distance.• Observe how magnets attract and repel each other and attract some materials and not others.• Compare and group together a variety of everyday materials based on whether they are attracted to a magnet and identify some magnetic materials.• Describe magnets as having two poles.• Predict whether two magnets with attract or repel each other depending on which poles are facing.		Sticky knowledge <ul style="list-style-type: none">• Magnets exert attractive and repulsive forces on each other.• Magnets exert non-contact forces which work through some materials.• Magnets exert attractive forces on some materials.• Magnet forces are affected by magnet strength/ object mass/ distance from object and object material. 	Vocabulary <p>Force, push, Pull, surface Attract, repel Compass, Friction Magnet Magnetic Magnetic field Pole, north South</p>	Key Scientists <p>William Gilbert (Theories of Magnetism)</p>
Prior Learning <p>In Year 2 children:</p> <ul style="list-style-type: none">• Could have an awareness of how to make things stop and start using simple pushes and pulls.• They could know about floating and sinking.		Key Questions (s): <ul style="list-style-type: none">• What are magnetic materials?• Can I make a magnetic material non-magnetic?• How far away does a magnet have to be before it attracts a magnetic material?• How far away can the magnetic attraction between two magnets be experiences?• Is the repulsive force the same size?• How is the magnetic attraction of repulsion force affected by putting materials between the magnets?• Are bigger magnets stronger?• How could you use magnets to measure the number of pages in a book?		Year 5 Learning (Next Stage of Study) <p>In Year 5 children will:</p> <ul style="list-style-type: none">• Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object and the impact of gravity on our lives.• Identify the effects of air resistance/water resistance and friction which act between moving surfaces.• recognise that some mechanisms including levers/pulleys and gears allow a smaller force to have a greater effect.• 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.• Describe the idea of the Earth’s rotation to explain day and night and the apparent movement of the sun across the sky.
Teaching Ideas (Working Scientifically)				
Comparative tests	Identify & classify	Observation over time	Pattern Seeking	Research
How does the mass of an object affect how much force is needed to make it move?	Which materials are magnetic?	If we magnetise a pin how long does it stay magnetised for?	Do magnetic materials always conduct electricity?	How have our ideas on forces changed over time?

Year 3 – Energy (Light and Sight)

National Curriculum Objectives <ul style="list-style-type: none">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 a solid object.Find patterns in the way that the sizes of shadows change.		Sticky knowledge <ul style="list-style-type: none">There must be light for us to see.Without light it is dark.We need light to see things even shiny things.Transparent materials let light travel through them, and opaque materials don't let light through.Beams of light bounce off some materials.Shiny materials reflect light beams better than non-shiny materials.Light comes from a source.	 Vocabulary <p>Light source Dark, Reflect Ray Mirror, Bounce Visible, Beam Sun, Glare Travel, Straight Opaque, Shadow Block, Transparent, Translucent</p>	Key Scientists <p>James Clerk Maxwell (visible/invisible Waves of Light)</p>
Prior Learning		Key Questions (s):	Year 6 Learning (Next Stage of Study)	
In Year 1 children should: <ul style="list-style-type: none">Observe changes across the four seasonsObserve and describe weather associated with the seasons and how day length varies <p>Pupils could:</p> <ul style="list-style-type: none">have some knowledge of where light comes from.have seen their shadows and may know they appear when it is sunny.have some understanding of a reflection.could understand they need light to be able to see things.		<ul style="list-style-type: none">A coin is lost, what would be the best way to find it?How does distance from a light source affect how bright it looks?How does being in darkness affect your sense of hearing?What colour would be the best material to make a blind for a baby's room?How does thickness of a material affect how much light can pass through it?How many pieces of tracing paper are as translucent as a single piece of white paper?How does the shape of a mirror affect how the light reflects? <p>How can we change the darkness, size and shapes of a shadow?</p>	In Year 6 children will: <ul style="list-style-type: none">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 that cast them.Know how simple optical instruments work.	
Teaching Ideas (Working Scientifically)				
Comparative tests	Identify & classify	Observation over time	Pattern Seeking	Research
How does the distance between the shadow puppet and the screen affect the seize of shadow?	How would you organise these light sources into natural and artificial sources?	When is our classroom darkest?	Are you more likely to have bad eyesight and to wear glasses if you are older?	How does the Sun make light?



Curriculum coverage and progression

SUBJECT: Science


Year 4

Science Topic	Exploration leading to Fair-test/pattern seeking	Observation over time	Classification and identification
Living things and their habitats		They should identify how the local habitat changes throughout the year	Classify animals into major groups such as vertebrates (animals with backbones) into fish amphibians, reptiles, birds and mammals: invertebrates into snails and slugs, worms, spiders and insects. Plants are more difficult to classify, but can be grouped into categories such as trees, grasses, flowers, and non -flowering plants such as ferns and mosses Use guides and keys to identify local small invertebrates Make a guide to local living things
Animals, including humans	Find out what damages teeth		Compare the teeth of carnivores and herbivores
States of matter	Explore the effect of temperature on different substances such as chocolate, butter and cream. Investigate the effect of temperature on washing drying or snowmen melting	Observe water as a solid, a liquid and a gas and should note the changes to water when it is heated or cooled. Observe and record evaporation over a period of time, such as a puddle in the playground or washing drying on a washing line	Group and classify a variety of different materials
Sound	Explore how the pitch and volume of sounds can be changed in a variety of ways, and finding patterns in data. Finding patterns in the sounds that are made by different objects elastic bands of different thicknesses Make ear muffs from a variety of different materials to investigate which provides the best insulation against sound.		




Electricity	Observing patterns, for example that the bulbs get brighter if more cells are added, that metals tend to be conductors of electricity, and that some materials can and some cannot be used to connect across a gap in a circuit		
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Year 4 - Animals, including Humans

National Curriculum Objectives <ul style="list-style-type: none">Describe the simple functions of the basic parts of the digestive system in humans.Identify the different types of teeth in humans and their simple functions.Construct and interpret a variety of food chains/identifying producers/predators and prey		Sticky knowledge <ul style="list-style-type: none">Animals have teeth to help them eat.Different types of teeth do different jobs.Food is broken down by the teeth and further in the stomach and intestines where nutrients go into the blood.The blood takes nutrients around the body.Nutrients produced by plants move to primary consumers through food chains. 		Vocabulary Herbivore, carnivore Digestive System, Tongue mouth, Teeth, Oesophagus Stomach, Gall Bladder Small Intestine, Pancreas Large Intestine, Liver Tooth, Canine, Incisor molar, Premolar, Producer consumer	Key Scientists Ivan Pavlov (digestive system mechanisms)
Prior Learning		Key Questions (s):		Year 5 Learning (Next Stage of Study)	
In Year 3 children should: <ul style="list-style-type: none">Identify that animals including humans need the right types and amount of nutrition and they cannot make their own food; they get their nutrition from what they eat.Know how nutrients, water and oxygen are transported within animals and humans.Know about the importance of a nutritious, balanced diet.Identify that humans and some other animals have skeletons and muscles for support, protection and movement.		<ul style="list-style-type: none">What different types of food are there?Why do we need a variety of different foods?Do all organisms eat the same things?Why do some people need different diets?Why are teeth important?What happens to our food?What is our digestive system?How does our food turn into poo and wee?		In Year 5 children will: <ul style="list-style-type: none">Know the life cycle of different living thingsKnow the difference between different life cycles.Know the process of reproduction in plants.Know the process of reproduction in animals	
Teaching Ideas (Working Scientifically)					
Comparative tests	Identify & classify	Observation over time	Pattern Seeking	Research	
In our class, are omnivores taller than vegetarians?	What are the names for all the organs involved in the digestive system? How can we organise teeth into groups?	How does an eggshell change when it is left in cola?	Are foods that are high in energy always high in sugar?	How do dentists fix broken teeth?	


Year 4 – Living Things and their Habitats

National Curriculum Objectives <ul style="list-style-type: none">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 danger to living things.		Sticky knowledge <ul style="list-style-type: none">Living things can be divided into groups based upon their characteristicsEnvironmental change affects different habitats differentlyDifferent organisms are affected differently by environmental changeDifferent food chains occur in different habitatsHuman activity significantly affects the environment		Vocabulary <ul style="list-style-type: none">Environment, floweringNonflowering, plantsAnimals, vertebratesFish amphibiansReptiles, invertebrateMammals, human impactNature, reservesdeforestation	Key Scientists <ul style="list-style-type: none">Cindy Looy (environmental change/extinction)
Prior Learning		Key Questions (s):		Year 5 Learning (Next Stage of Study)	
In Year 2 children should: <ul style="list-style-type: none">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.Describe how animals obtain their food from plants and other animals using the idea of a simple food chain and identify and name the different sources of food.		What food chains & webs are there in our local habitat? <ul style="list-style-type: none">How does energy move through the food chain?How does removal of one species from an environment affect others?How does environmental change affect different organisms?What are the most important things we could do to improve our outside area?How does human activity affect our environment?		In Year 5 children will: <ul style="list-style-type: none">Describe the differences in the life cycles of a mammal/an amphibian/an insect and a bird.Describe the life process of reproduction in some plants and animals.	
Teaching Ideas (Working Scientifically)					
Comparative tests	Identify & classify	Observation over time	Pattern Seeking	Research	
Does the amount of light affect how many woodlice move around? How does the average temperature of the pond water change in each season?	Can we use the classification keys to identify all the animals that we caught pond dipping?	How does the variety of invertebrates on the school field change over the year?	How has the use of insecticides affected bee population?	Why are people cutting down the rainforests and what effect does that have?	


Year 4 – Electricity

National Curriculum Objectives <ul style="list-style-type: none">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 a lamp will light in a simple series circuit based on whether the lamp is part of a complete loop with a battery.Recognise that a switch opens and closes the circuit and associate this with whether a lamp lights in a simple series circuit. Recognise some common conductors and insulators and associate metals with being good conductors.Know the difference between a conductor and an insulator giving examples of each.Safety when using electricity.		Sticky knowledge <ul style="list-style-type: none">A source of electricity is needed for electrical devices to work.Electricity sources push electricity round the circuit faster.More batteries will push the electricity round the circuit faster.Devices work harder when more electricity goes through them.A complete circuit is needed for electricity to flow and devices to work.Some materials allow electricity to flow and devices to work.Some materials allow electricity to flow easily and these are called conductors. Materials that don't allow electricity to flow easily are called insulators.	 Vocabulary <p>Electricity, Electric Current Appliances Mains , Crocodile Clips Wires, Bulb, Battery Cell Battery Holder Motor Buzzer Switch conductor Electrical Insulator Component</p>	Key Scientists <p>Thomas Edison (Lightbulb)</p>
Prior Learning <p>In EYFS children should have:</p> <ul style="list-style-type: none">Some understanding that objects need electricity to work.Understand that a switch will turn something on or off.		Key Questions (s): <ul style="list-style-type: none">What would life to be like without electricity?What sorts of things use/need electricity?What electricity do I use?In which ways can we get electricity?How do we make electricity?How do batteries work?How quickly can batteries run out?How does the number of batteries added to the circuit affect a device?What materials can carry electricity?	Year 6 Learning (Next Stage of Study) <p>In Year 6 children will:</p> <ul style="list-style-type: none">Link 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.	
Teaching Ideas (Working Scientifically)				
Comparative tests	Identify & classify	Observation over time	Pattern Seeking	Research
How does the thickness of a conducting material affect how bright the lamp is?	How would you group these electrical devices based on where the electricity comes from>	How long does a battery light a torch for?	Which room has the most electrical sockets in a house?	How has electricity changed the way we live?

Year 4 – Materials (Solids, Liquids and Gases)

National Curriculum Objectives <ul style="list-style-type: none">Compare and group materials together, according to whether they are solids, liquids or gasses.Observe that some materials change state when heated or cooled, and measure and research the temperature at which this happens in degrees Celsius.Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.		Sticky knowledge <ul style="list-style-type: none">Solids, liquids and gases are described by observable properties.Materials can be divided in to solids, liquids and gases.Heating causes solids to melt in to liquids and liquids evaporate in to gases.The temperature at which given substances change state are always the same. 	Vocabulary <p>Solid, Liquid, Gas Particles, State, Materials Properties, Matter Melt, Freeze Water, Ice Temperature, Process Condensation, Evaporation Water, Vapour Energy, Precipitation Collection</p>	Key Scientists <p>Anders Celsius (Celsius Temperature Scale)</p>
Prior Learning <p>In KS1 children should:</p> <ul style="list-style-type: none">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 variety of everyday materials.Compare and group together a variety of everyday materials based on their simple physical properties.Identify and compare the suitability of a variety 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. <p>Pupils could also have some prior knowledge of rocks and what a fossil is.</p>		Key Questions (s): <ul style="list-style-type: none">How does the amount of water added to flour affect its state?How does the amount of detergent added to water affect how slippery it is?How does the temperature affect how viscous a liquid is?Is melting temperature of wax the same as its freezing temperature?		Year 5 Learning (Next Stage of Study) <p>In Year 5 children will:</p> <ul style="list-style-type: none">Compare and group together everyday materials based on their properties, including their hardness, solubility, transparency, conductivity, 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 uses of everyday materials including wood/metals and plastic.Demonstrate that dissolving mixing and changes of state are reversible changes.Explain that some changes result in the formation of new materials and this kind of change is usually not reversible including changes associated with burning and the action of acid on bicarbonate of soda.
Teaching Ideas (Working Scientifically)				
Comparative tests	Identify & classify	Observation over time	Pattern Seeking	Research
How does the mass of a block of ice affect how long it takes to melt?	Can you group these materials and objects in to solids, liquids and gases?	Which material is best for keeping our hot chocolate warm?	Is there a pattern in how long it takes different sized ice lollies to melt?	What are hurricanes and why do they happen?

Year 4 – Energy (Sound)

National Curriculum Objectives <ul style="list-style-type: none">Know how sound is made associating some of them vibrating.Know what happens to a sound as it travels from its source to our ears.Know the correlation between the volume of a sound and the strength of the vibrations that produced it.Know how sound travels from a source to our ears.Know the correlation between pitch and the object producing a sound.		Sticky knowledge <ul style="list-style-type: none">Sound travels from its source in all directions and we hear it when it travels to our ears.Sound travel can be blocked.Sound spreads out as it travels.Changing the shape, size and material of an object will change the sound it produces.Sound is produced when an object vibrates.Sound moves through all materials by making them vibrate.Changing the way an object vibrates changes its sound.Bigger vibrations produce louder sounds and smaller vibrations produce quieter sounds.Faster vibrations produce higher pitched sounds		Vocabulary amplitude, volume quiet, loud ear, pitch high, low particles, instruments wave	Key Scientists Aristotle (sound waves)
Prior Learning In KS1 children: <ul style="list-style-type: none">Could have some understanding that objects make different soundsCould have some understanding that they use their ears to hear sounds.Know about their different senses.		Key Questions (s): <ul style="list-style-type: none">How can you change the volume of a sound?How does the size of an ear trumpet affect the volume of sound detected?How does the type of material affect how well it blocks a sound?How does thickness of material affect how well it blocks a sound?Which materials vibrate better and produce louder sounds?Which materials make the best string telephone components?How does length of the tube affect the pitch and volume?Can you predict the relative pitch of tuning forks from the patterns of ripples they make in the water?		KS3 Learning (Next Stage of Study) In KS3 children will learn: <ul style="list-style-type: none">frequencies of sound waves measured in hertz, echoes, reflection and absorption of soundsound needs a medium to travel, the speed of sound in air, in water, in solidssound produced by vibrations of objects, in loudspeakers, detected by their effects on microphone diaphragm and the ear drum; sound waves are longitudinalauditory range of humans and animals.	
Teaching Ideas (Working Scientifically)					
Comparative tests	Identify & classify	Observation over time	Pattern Seeking	Research	
How does the volume of a drum change as you move further away from it?	Which material is best to use for muffling sound in ear defenders?	When is our classroom the quietest?	Is there a link between how loud it is in school and the time of day?	Do all animals have the same hearing range?	




Curriculum coverage and progression

SUBJECT: Science


Year 5

Science Topic	Exploration leading to Fair-test/pattern seeking	Observation over time	Classification and identification
Living things and their habitats	Try growing new plants from different parts of the parent plant, for example seeds, stem and root cuttings, tubers, and bulbs.	Observing and comparing the life cycles of plants and animals in their local environment with other animals around the world. Observe changes in an animal over a period of time e.g. rearing chicks	Compare how different animals reproduce and grow.
Animals, including humans		Research the gestation periods of other animals and compare them with humans. Record the length and mass of a baby as it grows. (compare with an adult for the same time period)	
Properties and changes of materials	Explore reversible changes, including evaporating, filtering, sieving, melting and dissolving. Explore changes that are difficult to reverse, for example, burning, rusting and other reactions, for example vinegar with bicarbonate of soda. Investigate questions such as 'Which materials would be the most effective for making a warm jacket, or wrapping ice cream to stop it melting. They might compare materials in order to make a switch in a circuit.		
Earth and space	Construct simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day		
Forces	Explore falling paper cones or cupcakes. Design and make parachutes having carried out fair tests to determine which design are the most effective. Explore resistance in water by making and testing boats of different shapes. Explore the effects of levers, pulleys, gears and/ or springs		


Year 5 - Animals, including Humans

National Curriculum Objectives <ul style="list-style-type: none">Describe the changes as humans develop to old age.		Sticky knowledge <ul style="list-style-type: none">Different animals mature at different rates and live to different ages.Puberty is something we all go through, a process which prepares our bodies for being adults and reproductionHormones control these changes which can be physical and/or emotional.		Vocabulary Foetus, Embryo, Womb Gestation Baby, Toddler Teenager, Elderly, Growth Development, Puberty Hormone, Physical Emotional	Key Scientists Dr Steve Jones (Geneticist)
Prior Learning		Key Questions (s):		Year 6 Learning (Next Stage of Study)	
In Year 4 children should: <ul style="list-style-type: none">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.		<ul style="list-style-type: none">What do humans look like?Do all animal embryos look the same?How do humans change?Why do humans change?What causes puberty?What changes do we go through during puberty?What changes do we go through during puberty?Are there any patterns between vertebrate animals and their gestation periods?		In Year 6 children will: <ul style="list-style-type: none">Identify and name the main parts of the human circulatory system and describe the functions of the heart/blood vessels and blood.Recognise the impact of diet/exercise/drugs and lifestyle on the way their bodies function.Describe the ways in which nutrients and water are transported within animals including humans.	
Teaching Ideas (Working Scientifically)					
Comparative tests	Identify & classify	Observation over time	Pattern Seeking		Research
How does age affect a human’s reaction time?	Can you identify all the stages in the human life cycle?	How do different animal embryos change?	Is there a relationship between a mammal’s size and its gestation period?		Why do people get grey/white hair when they get older?


Year 5 – Materials (Changes)

National Curriculum Objectives <ul style="list-style-type: none">Compare and group together everyday materials based on their properties including their hardness, solubility, transparency, conductivity (electrical and thermal) and response to magnets.Comparative and fair tests, for the uses of everyday materials including wood, metals and plastics.Demonstrate that dissolving, mixing and changes of state are reversible changes.Explain that some changes result in the formation of new materials and this kind of change is usually not reversible including changes associated with burning and the action of acid on bicarbonate of soda.		Sticky knowledge <ul style="list-style-type: none">All matters have mass.Sometimes mixed substances react to make a new substance.Heating can sometimes cause materials to change permanently.Indicators that something new has made are: The properties of the material are different.If it is not possible to get the material back easily it is likely that it is not there anymore and something new has made (irreversible change). 	Vocabulary Hardness, Solubility, Transparency, Conductivity Magnetic, Filter, Evaporation Dissolving, Mixing, Material, Conductor Dissolve, Insoluble, Suspension, Chemical Physical, Irreversible, Solution Reversible, Separate, Mixture, Insulator Transparent, Flexible, Permeable Soluble, Property, Magnetic hard	Key Scientists Spencer Silver (Post-it-notes)
Prior Learning In Year 4 children should: <ul style="list-style-type: none">Compare and group materials together, according to whether they are solids, liquids or gasses.Observe that some materials change state when heated or cooled, and measure and research the temperature at which this happens in degrees Celsius.Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.		Key Questions (s): <ul style="list-style-type: none">The key questions we want children to interrogate is “have we made a new substance”?Add sugar to fizzy water; it fizzes up. Has a new substance been made?Add baking powder to vinegar, it fizzes up. Has a new substance been made?	KS3Learning (Next Stage of Study) In KS3 children will learn: <ul style="list-style-type: none">the concept of a pure substance mixtures including dissolvingdiffusion in terms of the particle modelsimple techniques for separating mixtures: filtration, evaporation, distillation and chromatographythe identification of pure substances	
Teaching Ideas (Working Scientifically)				
Comparative tests	Identify & classify	Observation over time	Pattern Seeking	Research
Which materials rusts fastest/slowest?	Can you identify and classify these reactions and changes in to reversible and irreversible?	How does a nail in saltwater change over time?	What patterns can you notice in different reactions?	What are smart materials and how can they help us?


Year 5 – Living Things and their Habitats

National Curriculum Objectives <ul style="list-style-type: none">Know the life cycle of different living thingsKnow the process of reproduction in plantsKnow the process of reproduction in animals		Sticky knowledge <ul style="list-style-type: none">Different animals mature at different rates and live to different ages.Some organisms reproduce sexually where offspring inherit information from both parents.Some organisms reproduce asexually by making a copy of a single parent.Environmental change can affect how well an organism is suited to its environment.Different types of organisms have different lifecycles. 	Vocabulary <p>Reproduction, sexual asexually, pollination dispersal, reproduction Cell, Fertilisation male, Female Pregnancy, young mammal metamorphosis Amphibian, Insect Egg, Embryo Bird, Plant</p>	Key Scientists <p>James Brodie (reproduction of plants by spores)</p>
Prior Learning <p>In Year 4 children should:</p> <ul style="list-style-type: none">Construct and interpret a variety of food chains, identifying producers/predators and preyIdentify 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		Key Questions (s): <ul style="list-style-type: none">What is a life cycle? What types of life cycles are there?Are life cycles the same?Do plants reproduce in the same ways as us?How do plants spread their seeds?	Year 6 Learning (Next Stage of Study) <p>In Year 6 children will:</p> <ul style="list-style-type: none">Classify living things into broad groups according to observable characteristics and based on similarities and differences.Give reasons for classifying plants and animals based on specific characteristics.	
Teaching Ideas (Working Scientifically)				
Comparative tests	Identify & classify	Observation over time	Pattern Seeking	Research
How does the level of salt affect how quickly brine shrimp hatch?	Compare this collection of animals based on similarities and differences in their lifecycle.	How do brine shrimp change over their lifetime?	Is there are relationship between number of petals and number of stamens?	What are the differences between the life cycle of an insect and a mammal?


Year 5 – Forces

National Curriculum Objectives <ul style="list-style-type: none">Explain the unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object and the impact of gravity on our lives.Identify the effects of air resistance/water resistance and friction which act between moving surfaces.Recognise that some mechanisms, including leavers, pulleys, and gears, allow a smaller force to have a greater effect		Sticky knowledge <ul style="list-style-type: none">Air resistance and water resistance are forces against motion caused by objects having to move air and water out of their way.Friction is a fore against motion caused by two surfaces rubbing against each other.Some objects require large forces to make the move; gears, pulley and leavers can reduce the force needed to make things move		Vocabulary <p>Air resistance Water resistance Friction, Gravity Newton, Gears Pulleys, Force Push, Puller Opposing, Streamline Brake Mechanism, Lever Cog Machine</p>	Key Scientists <p>Galileo Galilei (Gravity/Acceleration)</p>
Prior Learning <p>In Year 3 children should:</p> <ul style="list-style-type: none">Compare how things move on different surfaces.Know how a simple pulley works and use making lifting an object simplerNotice that some forces need contact between two objects but magnetic forces can act at a distance.Observe how magnets attract and repel each other and attract some materials and not others.Compare and group together a variety of everyday materials based on whether they are attracted to a magnet and identify some magnetic materials.Describe magnets as having two poles.Predict whether two magnets with attract or repel each other depending on which poles are facing		Key Questions (s): <ul style="list-style-type: none">What is a force?How can a force act on an object?How can we see forces?How can we measure forces?How does the saltiness of water affect the water resistance?How does the length of a piece of a paper helicopter's wings affect the time it takes to fall?How does changing the shape of a piece of plasticine affect water resistance?How does adding holes to a parachute affect the time it takes to fall?How does the amount/depth of tread affect the friction between a shoe and a surface?How can we use levers to lift heavy objects?How do see-saws work?Can you create a pulley system to life a given load?		KS3 Learning (Next Stage of Study) <p>In KS3 children will learn:</p> <ul style="list-style-type: none">opposing forces and equilibrium: weight held by stretched spring or supported on a compressed surfaceforces being needed to cause objects to stop or start moving, or to change their speed or direction of motionchange depending on direction of force and its size	
Teaching Ideas (Working Scientifically)					
Comparative tests	Identify & classify	Observation over time	Pattern Seeking	Research	
How does the angle of launch affect how far a paper rocket will go?	Can you label and name all the forces acting on the objects in each of these situations?	How long does a rope on a climbing frame swing for before it comes still?	Do all objects fall through water in the same way?	How do submarines sink if they are full of air?	

Year 5 – Materials (Mixtures and Separation)

National Curriculum Objectives <ul style="list-style-type: none">Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperatures.Know that some materials will dissolve in liquid to form a solution and describe how to recover a substance form a solution.Use knowledge of solids, liquids and gases to decide how mixtures could be separated including through filtering/sieving and evaporating.		Sticky knowledge <ul style="list-style-type: none">When two or more substances are mixed and remain present the mixture can be separated.Some changes can be reversed, and some cannot.Materials change state by heating and cooling.		Vocabulary Solid, Liquid, Gas Particles, State, Materials Properties, Matter, Melt Freeze, Water, Ice Temperature, Process, Condensation Evaporation, Water, Vapour Energy, Precipitation, Collection	Key Scientists Spencer Silver (Post-it-notes)
Prior Learning		Key Questions (s):		Year 5 Learning (Next Stage of Study)	
In KS1 children should: <ul style="list-style-type: none">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 variety of everyday materials.Compare and group together a variety of everyday materials based on their simple physical properties.Identify and compare the suitability of a variety 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.		<ul style="list-style-type: none">What are mixtures?What does dissolve mean?Which of the following dissolve in water: sugar, bicarbonate of soda, oil, chocolate, coffees, dark vinegar and wax?How does the amount of water used affect how much sugar will dissolve in it?Which sweets dissolve in water?How can we separate mixtures?How can we clean our dirty water?		In Year 5 children will: <ul style="list-style-type: none">Compare and group together everyday materials based on their properties, including their hardness, solubility, transparency, conductivity, and response to magnets.Give reasons based on evidence from comparative and fair tests, for the uses of everyday materials including wood/metals and plastic.Demonstrate that dissolving mixing and changes of state are reversible changes.Explain that some changes result in the formation of new materials and this kind of change is usually not reversible including changes associated with burning and the action of acid on bicarbonate of soda.	
Teaching Ideas (Working Scientifically)					
Comparative tests	Identify & classify	Observation over time	Pattern Seeking	Research	
How does the temperature of tea affect how long it takes a sugar cube to dissolve?	Can you group these materials based on whether they are transparent or not?	How does a container of saltwater change over time?	Do all stretchy materials stretch in the same way?	What are microplastics and why are they harming the planet?	

Year 5 – Earth and Space

National Curriculum Objectives <ul style="list-style-type: none">Describe the movement of the Earth, and other planets, relative to the Sun in the solar systemDescribe the movement of the Moon relative to the EarthDescribe the Sun, Earth and Moon as approximately spherical bodiesDescribe the idea of the Earth’s rotation to explain day and night and the apparent movement of the sun across the sky.		Sticky knowledge <ul style="list-style-type: none">Stars, planets and moons have so much mass they attract other things including each other due to a force called gravity. Gravity works over distance.Objects with larger masses exert bigger gravitational forces.Objects like planets, moons and stars spin.Smaller mass objects like planets orbit large mass objects like stars.Stars produce vast amounts of heat and light.All other objects are lumps of rock, metal or ice and can be seen because they reflect the light of stars. 	Vocabulary <p>Earth, Sun Moon, Axis, Rotation Day, Night , Phrases of the Moon, Star, Constellation Waxing, Waning Crescent, Gibbous Mercury, Venus Mars, Jupiter, Saturn Uranus, Neptune, Planets, Solar system, Rotate, Orbit Axis Spherical Geocentric Heliocentric</p>	Key Scientists Tim Peake
Prior Learning		Key Questions (s):	KS3 Learning (Next Stage of Study)	
In KS1 and in Year 3 children should: <ul style="list-style-type: none">Understand changes in weather patterns and seasons.Compare how things move on different surfaces.Notice that some forces need contact between two objects, but magnetic forces can act at a distance.Describe magnets as having two poles. Predict whether two magnets with attract or repel each other, depending on which poles are facing.		<ul style="list-style-type: none">How does temperature/size/length/year length change as you get closer/further to the sun?How does distance from a light source affect how much light hits an object?Does having more moons result in more light hitting a planet?How does speed/size of a meteorite affect the size of the moon crater formed?	In KS3 children will learn: <ul style="list-style-type: none">Gravity force, weight= mass x gravitational field strength(g), on Earth g=10 N/kg, different on other planets and stars; gravity forces between Earth and Moon, and between Earth and SunOur Sun as a star, other stars in our galaxy, other galaxiesThe seasons and the Earth’s tilt, day length at different times of year, in different hemispheres the light year as a unit of astronomical distance.	
Teaching Ideas (Working Scientifically)				
Comparative tests	Identify & classify	Observation over time	Pattern Seeking	Research
How does the length of daylight hours change in each season?	How could you organise all the objects in the solar system into groups?	Can you observe and identify all the phrases in the cycle of the Moon?	Is there a pattern between the size of a planet and the time it takes to travel around the Sun?	What unusual objects did Jocelyn Bell Burnell discover>




Curriculum coverage and progression

SUBJECT: Science

Year 6


Science Topic	Exploration leading to Fair-test/pattern seeking	Observation over time	Classification and identification
Living things and their habitats			Look at the classification system in more detail. Be introduced to the idea that broad groupings, such as micro-organisms, plants and animals can be subdivided. Through direct observations where possible they should classify animals into vertebrates and invertebrates. Use classification systems and keys to identify some animals and plants in the immediate environment
Animals, including humans			
Evolution and inheritance	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 lung, tendrils on climbing plants, brightly coloured and scented flowers		Comparing how some living things are adapted to survive in extreme conditions for example, cactuses, penguins, and camels.
Light	Investigate 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.		
Electricity	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		

Year 6 - Animals, including Humans

National Curriculum Objectives <ul style="list-style-type: none">Identify and name the main parts of the human circulatory system and describe the functions of the heart/blood vessels and blood.Recognise the impact of diet/exercise/drugs and lifestyle on the way their bodies function.Describe the ways in which nutrients and water are transported within animals including humans.	Sticky knowledge <ul style="list-style-type: none">The heart pumps blood around the body.Oxygen is breathed into the lungs where it is absorbed by the blood.Muscles need oxygen to release energy from food to do work. 	Vocabulary <p>Oxygenated deoxygenated Valve, exercise respiration circulatory system heart, lungs blood, vessels blood, artery, vein, pulmonary alveoli, capillary digestive, transport, gas exchange, villi, nutrients water, oxygen alcohol, drugs, tobacco</p>	Key Scientists <p>Justus von Liebig (Theories of nutrition/metabolism)</p>	
Prior Learning <p>In Year 5 children should: Describe the changes as humans develop to old age.</p>	Key Questions (s): <ul style="list-style-type: none">Why do we need oxygen?How do we breathe?Do fish and plants breathe?Do all living things need oxygen?How does the size of a person’s lungs affect their lung capacity?Are there ways to increase/decrease our lung capacity? Is lung capacity fixed?Why do we have blood?How does our heart work?How does size of muscle affect our pulse rate?How does exercise effect our pulse rate?How might the circulatory system of an elephant/a hummingbird or a polar bear differ?Is the air you breathe out the same as that you breathe in?	Learning in KS3 (Next Stage of Study) <p>In KS3 children will:</p> <ul style="list-style-type: none">the hierarchical organisation of multicellular organisms: from cells to tissues to organs to systems to organisms.the tissues and organs of the human digestive system including adaptations to function and how the digestive system digests foodcalculations of energy requirements in a healthy daily dietthe consequences of imbalances in the diet including obesity/starvation and deficiency diseasesthe structure and functions of the gas exchange system in humans including adaptations to functionthe effects of recreational drugs on behaviour health and life processes.		
Teaching Ideas (Working Scientifically)				
Comparative tests	Identify & classify	Observation over time	Pattern Seeking	Research
How does the length of time we exercise for affect our heart rate?	Which organs of the body make up the circulation system and where are they found?	How does my heart rate change over the day? How much exercise do I do in a week?	Is there a pattern between what we eat for breakfast and how fast we can run?	How have our ideas about disease and medicine changed over time?




Year 6 – Evolution and Inheritance


National Curriculum Objectives <ul style="list-style-type: none">• know about evolution and can explain what it is.• Know how fossils can be used to find out about the past.• 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 adaptations may lead to evolution-recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago	Sticky knowledge <ul style="list-style-type: none">• Life cycles have evolved to help organisms survive to adulthood.• Over time the characteristics that are most suited to the environment become increasingly common. 	Vocabulary <p>Fossils Adaptations, Evolution Characteristics, Reproduction Genetics, Variation, Inherited Environmental Mutation Competition Survival Of The Fittest Evidence</p>	Key Scientists <p>Charles Darwin Jane Goodall</p>	
Prior Learning <p>From Key Stages 1/2, children should:</p> <ul style="list-style-type: none">• Understand there is a variety of life on Earth• Know that some animal's differences are important to their survival• Know how animals and plants reproduce• Know how fossils form over time	Key Questions (s): <ul style="list-style-type: none">• Why are we all different?• What is variation and why is it important?• How did life begin on Earth?• How do we change?• What is evolution?• What evidence is there for evolution?• How does evolution happen?• What reasons do animals become extinct?• Polar Bear’s habitat is rapidly changing what possible futures do they face and can we predict which is most likely?• How did Darwin come up with the theory?• Why was his theory not initially accepted?	Learning in KS3 (Next Stage of Study) <p>In KS3 children will learn the following:</p> <ul style="list-style-type: none">• heredity as the process by which genetic information is transmitted from one generation to the next• the variation between individual within a species being continuous or discontinuous to include measurement and graphical representation of variation• the variation between species and between individuals of the same species means some organisms compete more successfully which can drive natural selection• changes in the environment may leave individuals within a species and some entire species less well adapted to complete successfully and reproduce which in turn may lead to extinction• the importance of maintaining biodiversity and the use of gene banks to preserve hereditary material.		
Teaching Ideas (Working Scientifically)				
Comparative tests <p>What is the most common eye colour in our class?</p>	Identify & classify <p>Compare the skeletons of apes/humans and Neanderthals-how are they similar and how are they different?</p>	Observation over time <p>How has the skeleton of the horse changed over time?</p>	Pattern Seeking <p>Is there a pattern between the size and shape of a bird’s beak and the food it will eat?</p>	Research <p>What happened when Charles Darwin visited the Galapagos islands?</p>




Year 6 – Living Things and their Habitats

National Curriculum Objectives <ul style="list-style-type: none">Classify living things into broad groups according to observable characteristics and based on similarities and differences.Give reasons for classifying plants and animals based on specific characteristics		Sticky knowledge <ul style="list-style-type: none">Variation exists within a population.Organisms best suited to their environment are more likely to survive long enough to reproduce.Organisms are best adapted to reproduce are more likely to do so.Organisms reproduce and offspring have similar characteristics patterns.Competitions exists for resources and mates. 	Vocabulary <p>Variation. Organisms Populations Classification Characteristics, Environment Flowering, Nonflowering Plants Animals, Vertebrates, Fish Amphibians, Reptiles Mammals, Invertebrate Human, Impact Nature, Reserves Deforestation Classify Compare Bacteria Microorganism, Organism Linnaean</p>	Key Scientists <p>Carl Linnaeus (identifying/ naming/classifying organisms)</p>
Prior Learning <p>In Year 4 children should:</p> <ul style="list-style-type: none">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 danger to living things.		Key Questions (s): <ul style="list-style-type: none">Why do we need to classify living things?How do we classify?What are the difficulties with classification?How do animals change over time?Why does variation exist?What happens if animals of different species breed?What happens to house plants outside?What are microorganisms?How can we prevent the spread of disease?Why do animals and plants compete-and what for?	KS3 Learning (Next Stage of Study) <p>In KS3 children will:</p> <ul style="list-style-type: none">the dependence of almost all life on Earth on the ability of photosynthetic organisms such as plants and algae to use sunlight in photosynthesis to build organic molecules that are an essential energy store and to maintain levels of oxygen and carbon dioxide in the atmospherethe adaptations of leaves for photosynthesis.the interdependence of organisms in an ecosystem including food webs and insect pollinated cropsthe importance of plant reproduction through insect pollination in human food securityhow organisms affect and are affected by their environment including the accumulation of toxic materials.	
Teaching Ideas (Working Scientifically)				
Comparative tests	Identify & classify	Observation over time	Pattern Seeking	Research
How does the temperature affect how much gas is produced by yeast?	How would you make a classification key for vertebrates/invertebrates or microorganisms?	What happens to a piece of bread if you leave it on the windowsill for two weeks?	Do all flowers have the same number of petals?	What do different types of microorganisms do?

Year 6 – Electricity

National Curriculum Objectives <ul style="list-style-type: none">Link 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.		Sticky knowledge  <ul style="list-style-type: none">Batteries are a store of energy. This energy pushes electricity round the circuit. When the battery’s energy is gone it stops pushing. Voltage measures the push.The greater the current flowing through a device the harder it works.Current is how much electricity is flowing round a circuit.When current flows through wires heat is released. The greater the current the more heat is released.	Vocabulary <p>Electricity, Neutrons Protons, Electrons Nucleus Atom. Electric Current Appliances Mains, Crocodile Clips Wires, Bulb, Battery Cell Battery Holder Motor Buzzer Switch Conductor Electrical Insulator Conductor.</p>	Key Scientists <p>Alessandro Volta (Electrical Battery)</p>
Prior Learning <p>In Year 4 children should:</p> <ul style="list-style-type: none">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 a lamp will light in a simple series circuit based on whether the lamp is part of a complete loop with a battery.Recognise that a switch opens and closes the circuit and associate this with whether a lamp lights in a simple series circuit. Recognise some common conductors and insulators and associate metals with being good conductors.Know the difference between a conductor and an insulator giving examples of each.Safety when using electricity.		Key Questions (s): <ul style="list-style-type: none">Do all batteries push as hard as each other?What is electricity?How does the voltage of a batters affect how much current is pushed?How does the length of time I leave the current flowing for affect the brightness of the bulb?How does number of bulbs affect the brightness of a bulb?Are all types of wires as good as conducting electricity?Why are wires insulated in plastic?Does length of wire make a difference?Does the type of circuit affect how the components work/long the battery lasts?What renewable ways can we generate electricity?How does current affect heat?What are the dangers of a short circuit?	KS3 Learning (Next Stage of Study) <p>In KS3 children will:</p> <ul style="list-style-type: none">Electric current measured in amperes in circuits series and parallel circuits currents add where branches meet and current as flow of chargePotential differences measured in volts/battery and bulb ratings resistance measured in ohms as the ratio of potential difference to currentDifferences in resistance between conducting and insulating componentsSeparation of positive or negative charges when objects are rubbed together: transfer of electrons forces between charged objectsThe idea of electric field forces acting across the space between objects not in contact.	
Teaching Ideas (Working Scientifically)				
Comparative tests	Identify & classify	Observation over time	Pattern Seeking	Research
How does the voltage of the batteries in a circuit affect the brightness of the lamp?	How would you group electrical components and appliances based on what electricity makes them do?	How does brightness of a bulb change as the battery runs out?	Does the temperature of a light bulb go up the longer it is on?	How has our understanding of electricity changed over time?

Year 6 – Energy (Light and Sight)

National Curriculum Objectives <ul style="list-style-type: none">• 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 that cast them.• Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them• Know how simple optical instruments work.		Sticky knowledge <ul style="list-style-type: none">• Animals see light sources when light travels from the source into their eyes.• Animals see objects when light is reflected off that object and enters their eyes.• Light reflects off all objects.• Light travels in straight lines. 	Vocabulary <p>Light source, Dark Reflect, Ray Mirror, Bounce Visible, Beam Sun, Glare Travel, Straight Opaque, Shadow Block, Transparent Translucent, Reflect Absorb, Emitted Scattered, Refraction</p>	Key Scientists <p>Thomas Young (Wave Theory of Light)</p>
Prior Learning <p>In Year 3 children should:</p> <ul style="list-style-type: none">• 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 a solid object.• Find patterns in the way that the sizes of shadows change.		Key Questions (s): <ul style="list-style-type: none">• How does the size of an object affect the size of a shadow?• How does the distance between the light and the object change the size of a shadow?• How does the distance between the object and the size of the screen affect the size of a shadow?• How would a solar eclipse be different if: -The moon was a different size? -The earth span faster or slower? The sun was larger or smaller? -If the earth and moon were the same size but further away in the solar system?• How perfect are our mirrors?• What happens to light when it is shone through water?• How does a periscope/microscope/telescope work?	KS3 Learning (Next Stage of Study) <p>In KS3 children will learn:</p> <ul style="list-style-type: none">• the similarities and differences between light waves and waves in matter• light waves travelling through a vacuum; speed of light• the transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface Science• use of ray model to explain imaging in mirror, the pinhole camera, the refraction of light and action of convex lens in focusing, the human eye• light transferring energy from source to absorber leading to chemical and electrical effects; photo-sensitive material in the retina and in cameras• colours and the different frequencies of light, white light and prisms; differential colour effects in absorption and diffuse reflection.	
Teaching Ideas (Working Scientifically)				
Comparative tests <p>How does the angle that a light ray hits a plan mirror affect the angle at which it reflects off the surface?</p>	Identify & classify <p>Can you identify all the colours of light that make white light when mixed together?</p>	Observation over time <p>Does the temperature of a light bulb go up the longer it is on?</p>	Pattern Seeking <p>Is there a pattern to how bright it is in school over the day?</p>	Research <p>Why do some people need to wear glasses to see clearly?</p>