Science Learning Journey

EYFS Curriculum		30 – 50 Months	50 – 60+ Months	Links to Science National Curriculum
Understanding the World	**People and Communities**	Remembers and talks about significant events in their own experience. Shows interest in different occupations and ways of life. Knows some of the things that make them unique, and can talk about some of the similarities and differences in relation to friends or family.		Working Scientifically – how scientific ideas have changed over time Occupations – scientists Animals including Humans (Human Body)
	The World	Comments and asks questions about aspects of their familiar world, such as the place where they live or the natural world. Can talk about some of the things they have observed, such as plants, animals, natural and found objects. Talks about why things happen and how things work. Developing an understanding of growth, decay and changes over time. Shows care and concern for living things and the environment.	Looks closely at similarities, differences, patterns and change.	Working Scientifically – pattern seeking, changes over time Animals including Humans, Living Things and their Habitats, Seasonal Changes, Materials, Forces, Plants
	Technology	Shows skill in making toys work by pressing parts or lifting flaps to achieve effects, such as sound, movements or new images.		Working Scientifically Electricity
Personal, Social and Emotional Development	**Self Confidence and Self Awareness**	Can select and use activities and resources with help.	Confident to speak to others about own needs, wants, interests and opinions.	Working Scientifically
	Managing Feelings and Behaviour			Working Scientifically
	Making Relationships	Can play in a group, **extending and elaborating play ideas**, e.g. building up a role-play activity with other children.	Explains own knowledge and understanding, and asks appropriate questions of others.	Working Scientifically
Physical Development	**Health and Self Care**	Observes the effects of activity on their bodies.	Eats a healthy range of foodstuffs and understands need for variety in food.	Animals including humans
Expressive Arts and Design	**Exploring and Using Media and Materials**		Understands that different media can be combined to create new effects.	Materials
Communication and Language	**Understanding**	Understands use of objects (e.g. “What do we use to cut things?’”) Beginning to understand ‘why’ and ‘how’ questions.	Listens and responds to ideas expressed by others in conversation or discussion.	Working Scientifically
	Speaking	Beginning to use more complex sentences to link thoughts (e.g. using and, because). Uses talk to connect ideas, explain what is happening and anticipate what might happen next, recall and relive past experiences. Questions why things happen and gives explanations. Asks e.g. who, what, when, how.	Extends vocabulary, especially by grouping and naming, exploring the meaning and sounds of new words. Uses talk to organise, sequence and clarify thinking, ideas, feelings and events.	Working Scientifically – identifying, classifying and grouping, questioning, explanations, predicting

Science Learning Journey

EYFS Early Learning Goals			Links to Science National Curriculum
Understanding the World	**People and Communities**	**Children know the difference between past and present events in their own lives and some reasons why people's lives were different in the past.** They know that other children have different likes and dislikes and that they may be good at different things. They understand that different people have different beliefs, attitudes, customs and traditions and why it is important to treat them with respect.	Working Scientifically – how scientific ideas have changed over time
	The World	Children know that the environment and living things are influenced by human activity. They can describe some actions which people in their own community do that help to maintain the area they live in. They know the properties of some materials and can suggest some of the purposes they are used for. They are familiar with basic scientific concepts, such as floating, sinking, experimentation.	Working Scientifically Animals including Humans, Living Things and their Habitats, Seasonal Changes, Materials, Forces
	Technology	Children find out about and use a range of everyday technology. They select appropriate applications that support an identified need. For example, in deciding how best to make a record of a special event in their lives, such as a journey on a steam train.	Working Scientifically
Personal, Social and Emotional Development	**Self Confidence and Self Awareness**	Children are confident speaking to a class group. They can talk about the things they enjoy, and are good at, and about the things they do not find easy. **They are resourceful in finding support when they need help or information. They can talk about the plans they have made to carry out activities and what they might change if they were to repeat them.**	Working Scientifically
	Managing Feelings and Behaviour	Children know some ways to manage their feelings and are beginning to use these to maintain control. **They can listen to each other's suggestions and plan how to achieve an outcome without adult help.** They know when and how two stand up for themselves appropriately. They can stop and think before acting and they can wait for things they want.	Working Scientifically
	Making Relationships	Children play group games with rules. **They understand someone else's point of view can be different from theirs.** They resolve minor disagreements through **listening to each other to come up with a fair solution.** They understand what bullying is and that this is unacceptable behaviour.	Working Scientifically
Physical Development	**Health and Self Care**	**Children know about, and can make healthy choices in relation to, healthy eating and exercise.** They can dress and undress independently, successfully managing fastening buttons or laces.	Animals including humans
Expressive Arts and Design	**Exploring and Using Media and Materials**	Children develop their own ideas through selecting and using materials and working on processes that interest them. Through their explorations they find out and make decisions about how media and materials can be combined and changed.	Materials
Communication and Language	**Understanding**	After listening to stories, **children can express views about events** or characters in the story and **answer questions about why things happened**. **They can carry out instructions which contain several parts in a sequence.**	Working Scientifically
	Speaking	Children show some awareness of the listener by making changes to language and non-verbal features. **They recount experiences and imagine possibilities, often connecting ideas. They use a range of vocabulary in imaginative ways to add information, express ideas or to explain or justify actions or events.**	Working Scientifically

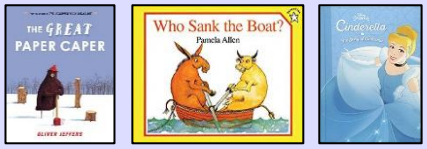
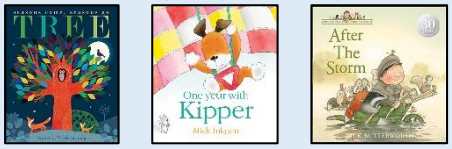
Science Learning Journey

Year 1 - Working Scientifically

- I can ask simple questions and recognise that they can be answered **in different ways.**
- I can use my observations and ideas to suggest answers to questions.
- I can identify and classify.
- I can observe closely, using simple equipment.
- I can perform simple tests.
- I can gather and record data to help in answering questions.

	Plants	Animals including humans	Everyday Materials	Seasonal Changes
Identifying, Grouping and Classifying *Making observations to name, sort and organise items.*	Exploring and observing the world around them at all times of the year Asking questions about the similarities and differences between things Reporting by producing scientific drawings of their observations, increasing in fine detail Developing scientific vocabulary, ideas and questions.			
Ideas linked to units	*How can we sort the leaves that we collected on our walk?*	*What are the names for all the parts of our bodies?* *How can we organise all the animals in a pet shop?*	*Which materials will float and which will sink?* *We need to choose a material to make an umbrella. Which materials are waterproof?*	*How would you group these things based on which season you are most likely to see them in?*
Comparative/Fair Testing *Changing one variable to see its effect on another, whilst keeping all others the same.*	Ask simple questions, perform simple tests, observe closely using simple equipment, gather and report findings using tally charts, pictograms, or block charts			
Ideas linked to units	*Which type of compost grows the tallest sunflower?* *Which tree has the biggest leaves?*	*Is our sense of smell better when we can't see?*	*Which materials are the most flexible/absorbent?*	*In which season does it rain the most?*
Pattern Seeking *Identifying patterns and looking for relationships in enquiries where variables are difficult to control.*	Begin to look for patterns in their measurements and observation, describe them both orally and in writing Start to think about cause and effect relationships and start to use appropriate vocabulary to discuss these			
Ideas linked to units	*Do trees with bigger leaves lose their leaves first in autumn?* *Is there a pattern in where we find moss growing in the school grounds?*	*Do you get better at smelling as you get older?*	*Is there a pattern in the types of materials that are used to make objects in a school?*	*Does the wind always blow the same way? Does it rain more in the spring? Do we have more sunny days in the summer? Which was the coldest month?*
Researching using secondary sources *Using secondary sources of information to answer scientific questions.*	Pose their own 'big question' and interpret the information they find and consider its relevance in answering their questions Begin to understand what a secondary source of information by exploring different types including books, websites, and video. Listen to presentations from experts and science professionals to get their information, or ask them questions in interviews and letters.			
Ideas linked to units	What are the most common British plants and where can we find them?	How are the animals in… different to the ones that we find in Britain? Do all animals have the same senses as humans?	How are bricks made? Which materials can be recycled?	Are there plants that are in flower in every season? What are they? Take weather measurements and make observations over time. Record/photograph what children are wearing
Observing over time *Observing changes that occur over a period of time ranging from minutes to months.*	Observing closely, recording observations and using observations to answer questions			
Ideas linked to units	*How does a daffodil bulb change over the year?* *How does my sunflower change each week?*	*How does my height change over the year?*	*What happens to materials over time if we bury them in the ground?* *What happens to shaving foam over time?*	*How does the oak tree change over the year?*
Exploring how scientific ideas have changed over time	Build understanding of what they believe a scientist to be by exploring the ideas of scientists Explore different ways of presenting their ideas through diagrams, posters, captions and digital recording			
Ideas linked to units **Famous Scientists/Inventors:**	*How did **Beatrix Potter** help our understanding of mushrooms and toadstools?* **Famous Scientist:** Beatrix Potter (Author & Botanist)	*What strange ideas did Italian scientist **Luigi Galvani** have about animals in 1780? Why did he think that?* **Famous Scientist:** Chris Packham (Animal Conservationist)	*How are building materials different now to when Queen Elizabeth I was on the throne?* **Famous Scientists:** William Addis (Toothbrush Inventor) Charles Mackintosh (Waterproof coat) Chester Greenwood (Earmuffs)	*How have the materials we use to make….changed over time?* **Famous Scientists** Dr Steve Lyons (Extreme Weather) Holly Green (Meteorologist)

Science Learning Journey

Year 1	Biology		Chemistry	Physics
Objectives	**Plants** I can identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. I can identify and describe the basic structure of a variety of common flowering plants, including trees.	**Animals including humans** I can identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. I can identify and name a variety of common animals that are carnivores, herbivores and omnivores. I can describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). I can identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	**Everyday materials** I can distinguish between an object and the material from which it is made. I can identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. I can describe the simple physical properties of a variety of everyday materials. I can compare and group together a variety of everyday materials on the basis of their simple physical properties.	**Seasonal changes** I can observe changes across the four seasons. I can observe and describe weather associated with the seasons and how day length varies
Vocabulary	**Plants** Deciduous, evergreen trees, leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, stem, bark, stalk, bud	**Animals including Humans** Fish, Reptiles, Mammals, Birds, Amphibians (+ examples of each) Herbivore, omnivore, carnivore, leg, arm, elbow, head, ear, nose, back, wings, beak, body, eyes, tail, claw, fin, scales, feathers, paw, hooves, fur Senses, touch, see, smell, hear, fingers, skin, eyes, nose, ears, tongue	**Everyday Materials** Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see through, not see through	**Seasonal Changes** Weather (sunny, rainy, windy, snowy etc.), seasons (Winter, Summer, Spring, Autumn), sun, sunrise, sunset, day length, monsoon, khareef (South-Eastern monsoon), thunder storm
Text Links	**A Little Guide to Wild Flowers** (*Charlotte Voake)* **The Things That I LOVE about TREES** *(Chris Butterworth)* **Harry's Hazelnut** *(Ruth Parsons)* 	**RSPB: My First Book of Garden Birds** *(Mike Unwin and Sarah Whittley)* **Snail Trail** *(Ruth Brown)* **Superworm** *(Julia Donaldson & Axel Scheffler)* 	**The Great Paper Caper** *(Oliver Jeffers)* **Who Sank the Boat** *(Pamela Allen)* **The Story of Cinderella** *(Walt Disney)* 	**Tree: Seasons Come, Seasons Go** *(Patricia Hegarty and Britta Teckentrup)* **One Year with Kipper** (*Mick Inkpen)* **After the Storm** *(Nick Butterworth)* 

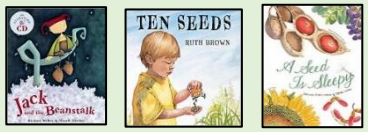
Science Learning Journey

Year 2 - Working Scientifically

- I can ask simple questions and recognise that they can be answered **in different ways.**
- I can use my observations and ideas to suggest answers to questions.
- I can identify and classify.
- I can observe closely, using simple equipment.
- I can perform simple tests.
- I can gather and record data to help in answering questions.

	Plants	Animals including humans	Living things and their habitats	Everyday Materials
Identifying, Grouping and Classifying *Making observations to name, sort and organise items.*	Exploring and observing the world around them at all times of the year Asking questions about the similarities and differences between things Reporting by producing scientific drawings of their observations, increasing in fine detail Developing scientific vocabulary, ideas and questions.			
Ideas linked to units	Classify seeds/bulbs *How can we identify the trees that we observe on our tree hunt?*	Classify food items, classify animals *Which offspring belongs to which animal?* *How would you group things to show which or living, dead or have never been alive?*	Classify minibeasts/plants found in the environment *How would you group these plants and animals based on what habitat you would find them in?*	Classify materials e.g. samples of wood, metal, plastic etc *Which materials are shiny and which are dull?*
Comparative/Fair Testing *Changing one variable to see its effect on another, whilst keeping all others the same.*	Ask simple questions, perform simple tests, observe closely using simple equipment, gather and report findings using tally charts, pictograms, or block charts			
Ideas linked to units	*Do cress seeds grow quicker inside or outside?* *Is there the same level of light in the evergreen wood compared with the deciduous wood?*	*Do bananas make us run faster?*	*Do amphibians have more in common with reptiles or fish?*	Test materials for different uses. *Which material can you use to make an aeroplane/curtain?* *Which shapes make the strongest paper bridge?* *Which material would be best for the roof of the little pig's house?*
Pattern Seeking *Identifying patterns and looking for relationships in enquiries where variables are difficult to control.*	Begin to look for patterns in their measurements and observation, describe them both orally and in writing Start to think about cause and effect relationships and start to use appropriate vocabulary to discuss these			
Ideas linked to units	*Do bigger seeds grow into bigger plants?* Does it matter which way round you plant a bulb or seed? Which comes first, the root or shoot?	*Which age group of children wash their hands the most in a day?* *Do children with the biggest feet have the biggest hands?*	Are there more daisies in the meadow or field? Where do you see more ivy? *Which habitat do worms prefer – where can we find the most worms?*	*Do all types of paper float?*
Researching using secondary sources *Using secondary sources of information to answer scientific questions.*	Pose their own 'big question' and interpret the information they find and consider its relevance in answering their questions Begin to understand what a secondary source of information by exploring different types including books, websites, and video. Listen to presentations from experts and science professionals to get their information, or ask them questions in interviews and letters.			
Ideas linked to units	Look at packets to decide how to plant/ care for seeds. How much water/shade do they *How does a cactus survive in a desert with no water?*	*What do you need to do to look after a pet dog/cat/lizard and keep it healthy?* *What food do you need in a healthy diet and why?*	*How does the habitat of the Arctic compare with the habitat of the rainforest?*	How are plastics made? (Lego?)
Observing over time *Observing changes that occur over a period of time ranging from minutes to months.*	Observing closely, recording observations and using observations to answer questions			
Ideas linked to units	Plant seeds and bulbs and observe how they grow. *What happens to my bean after I may planted it?*	Observe a life cycle (caterpillars, chicks, and farm animals) *How does a tadpole changed over time? How much food and drink do I have over a week?*	Explore animals in micro-habitats throughout the year (under rocks, logs, bushes and long grass) *How does a pond/woodland area change over a year?*	How have the materials we use changed over time? *Would a paper boat float forever?* *How long do bubble bath bubbles last for?*
Exploring how scientific ideas have changed over time	Build understanding of what they believe a scientist to be by exploring the ideas of scientists Explore different ways of presenting their ideas through diagrams, posters, captions and digital recording			
Ideas linked to units **Famous Scientists/Inventors:**	*What ideas did botanist Alan Tansley have about habitats in 1935?* **Famous Scientists:** Captain Cook/ Agnes Arber (Botanists)	*How did Florence Nightingale use maths to help her with ideas to improve nursing?* **Famous Scientists:** Florence Nightingale (Pioneer of modern nursing in GB)	*How did George Washington Carver use science to improve farming in America?* **Famous Scientists:** Rachel Carson (Marine Pollution) Charles H Turner (discovered insects hear)	*How have the materials we use to make….changed over time?* **Famous Scientists:** Charles Macintosh (Waterproof material)

Science Learning Journey

Year 2	Biology			Chemistry	Physics
Objectives	**Plants** I can observe and describe how seeds and bulbs grow into mature plants. I can find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	**Animals including humans** I can notice that animals, including humans, have offspring which grow into adults. I can find out about and describe the basic needs of animals, including humans, for survival (water, food and air). I can describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	**Living things and their habitats** I can explore and compare the differences between things that are living, dead, and things that have never been alive. I can 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. I can identify and name a variety of plants and animals in their habitats, including micro –habitats I can describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.	**Uses of Everyday materials** I can identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. I can find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	
Vocabulary	**Plants (See Y1 +)** Seeds, Bulbs, Water, Light, Temperature, Growth, Shade, Sun, Warm, Cool, Healthy	**Animals including humans (See Y1 +)** Survival, Water, Air, Food, Adult, Baby, Offspring, Reproduction, Stages, Growth, Child, Young/Old, Kitten, Calf, Puppy, Exercise, Hygiene, Heartbeat, Breathing, Hygiene, Germs, Disease, Food Types	**Living things and their habitats** Living, Dead, Habitat, Suitable, Suited, Basic Needs, Shelter, Move, Feed, Energy, Food chain, Predator, Prey, Woodland, Pond, Desert	**Everyday materials and their uses (See Y1 +)** Hard, Soft, Stretchy, Stiff, Shiny, Dull, Rough, Smooth, Bendy, Waterproof, Absorbent, Opaque, Transparent, Translucent, Reflective, Non-Reflective, Flexible, Rigid, Shape, Brick, Paper, Fabrics, Squashing, Bending, Twisting, Stretching Elastic, Foil	
Text Links	***Jack and the Beanstalk*** *(Richard Walker)* ***Ten Seeds*** *(Ruth Brown)* **A Seed Is Sleepy** (Dianna Aston) 	***The Gruffalo*** *(Julia Donaldson)* ***Meerkat Mail*** *(Emily Gravett)* ***No Place Like Home*** *(Jonathon Emmett)* 	***Handa's Surprise*** *(Eileen Brown)* ***Once There Were Giants*** *(Martin Waddell and Penny Dale)* ***Tadpole's Promise*** *(Jeanne Willis and Tony Ross)* 	***The Tin Forest*** *(Helen Ward)* ***Traction Man*** *(Mini Grey)* ***Three Little Pigs*** *(Lesley Sims)* 	

Science Learning Journey

Year 3 Working Scientifically

- I can ask relevant questions and use **different types of scientific enquiries** to answer them.
- I can set up simple practical enquiries, comparative and fair tests.
- I can make systematic and careful observations and take accurate measurements using standard units, using a range of equipment, including thermometers/data loggers.
- I can gather, record, classify and present data in a variety of ways to help answer questions.
- I can record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.
- I can report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.
- I can use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.
- I can identify differences, similarities or changes related to simple scientific ideas/processes.
- I can use straightforward scientific evidence to answer questions.

	Plants	Animals including humans	Rocks	Light	Forces and Magnets
Identifying, Grouping and Classifying *Making observations to name, sort and organise items.*	Regular revisit KS1 skills: Exploring and observing the world around them at all times of the year and asking questions about the similarities and differences between things Increased focus on measuring and using data to answer 'big questions'. Continue to build on their observational skills, becoming more independent in identifying, through the use of increasingly complex tools, explaining how they have chosen to group things. Design simple tests to help them classify materials, beginning to use a range of secondary sources with more independence to support them in identifying a range of living things.				
Ideas linked to units	*How many different ways can you group our seed collection?*	*How do the skeletons of different animals compare?* *How can we group the food that we eat?*	*Can you use the identification key to find out the name of each of the rocks in your collection?*	*How would you organise these light sources into natural and artificial sources?*	*Which materials are magnetic?*
Comparative/Fair Testing *Changing one variable to see its effect on another, whilst keeping all others the same.*	Plan their own tests to collect data gaining increasing independence. Learn to understand the different types of variables: the dependent variable that they will change in their test; the independent variable that they are going to measure so that they can find out how the dependent variable affects it; the control variables which the children will need to keep the same so that they don't affect their results. Use an increasingly wide range of equipment to make measurements and learn what it means to measure accurately and check for reliability. Learn to plan how to record and analyse the data with increasing independence, using tables, pictograms, and bar charts to compare the measurements they make. Use their data to draw conclusions about what they have found out to be the answer to their 'big question'. Begin to think about causal relationships. Evaluate the procedure they used and the quality of their data, suggesting ways they could improve their test. Begin to think about the reliability and accuracy of their data.				
Ideas linked to units	*Which conditions help seeds germinate faster?* *How does the length of the stem affect how long it take for the food colouring to dye the petals?*	*How does the skull circumference of a girl compare with that of a boy?* *How does the angle that your elbow/knee is bent affect the circumference of your upper arm/thigh?*	*Which soil absorbs the most water?* *How does adding different amounts of sand to soil affect how quickly water drains through it?*	*How does the distance of the puppet from the screen affect the size of the shadow?* *Which pair of sunglasses will protect our eyes best?*	*Which magnet is strongest?* *Which surface is best to stop you slipping?* *How does the mass of an object affect the force to move it?*
Pattern Seeking *Identifying patterns and looking for relationships in enquiries where variables are difficult to control.*	Begin to think for themselves when deciding what they should measure and observe. Begin to make decisions about the most appropriate equipment to use to collect data including data loggers. Using data analysis techniques to spot patterns, including using tabulated data and a variety of charts and graphs and begin use this to support their explanations when describing relationships. Use pattern seeking as a preliminary test; use their findings to form and justify their own predictions.				
Ideas linked to units	*What colour flowers do pollinating insects prefer?* *How does the structure of fruit relate to how seeds are dispersed?*	*Do male humans have larger skulls that female humans?* *Can children with longer legs run faster?*	*Is there a pattern in where we find volcanos on planet Earth?*	*What happens to shadows when a light source is moved?*	*Does the size and shape of a magnet affect how strong it is?* *Are all metals magnetic?*
Researching using secondary sources *Using secondary sources of information to answer scientific questions.*	Read for information and note-taking and learn to interpret the information they find and critically consider its relevance in answering their 'big questions'. Use a range of secondary sources, including books, websites, and video to find their information including listening to presentations from experts and science professionals. Find and collect more data in their research, questionnaires/interviews and use this to help answer questions. Begin to evaluate the quality of the information they have found and how well it has enabled them to draw conclusions and answer their 'big question'.				
Ideas linked to units	*What are all the different ways that seeds disperse?*	*Why do different types of vitamins keep us healthy, which foods can we find them in?*	*How are fossils formed? What types of animals can be found in fossils?*	*How does the Sun make light?*	*How does a compass work?*
Observing over time *Observing changes that occur over a period of time ranging from minutes to months.*	Explore and talk about their own and other people's scientific ideas, through a range of secondary sources of information, developing their use of scientific language. Begin to recognise how scientific ideas change and develop over time. Explain ideas using their scientific knowledge and understanding using increasingly accurate scientific language.				
Ideas linked to units	*What happens to celery/flower when it is left in a glass of coloured water?*	*How do humans change as they grow? (skeleton focus)*	*How does tumbling change a rock over time? What happens when water drips on a sandcastle?*	*When is our classroom darkest?* *Is the Sun the same brightness all day?*	*If we magnetise a pin, how long does it stay magnetised for?*
Exploring how scientific ideas have changed over time	Explore and talk about their own and other people's scientific ideas Evaluate the significance, strengths and weaknesses of different scientists' ideas.				
Ideas linked to units **Famous Scientists/Inventors:**	*How have we used plants to help us throughout history?* **Famous scientists:** Joseph Banks (Botanist)	*How did chemist, **Marie Maynard Daly**, use science to help us improve our diets?* **Famous scientists:** Wilhelm Rontgen (X rays)	*How did **Mary Anning's** work help us to understand prehistoric life?* **Famous Scientists** Mary Anning (Fossil Hunter)	*How have our ideas about eclipses changed over time?* **Famous scientists:** Justus Von Liebig Mirrors	*How have our ideas about magnets changed over time?* **Famous scientists:** Andre Marie Ampere (Electro-magnetism) The Wright Brothers (Airplanes)

Science Learning Journey

Year 3	Biology		Chemistry	Physics	
Objectives	**Green plants** I can identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. I can explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant. I can investigate the way in which water is transported within plants. I can explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	**Animals including humans/The Human body** I can identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat. I can identify that humans and some other animals have skeletons and muscles for support, protection and movement.	**Rocks** I can compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. I can describe in simple terms how fossils are formed when things that have lived are trapped within rock. I can recognise that soils are made from rocks and organic matter.	**Light** I can recognise that I need light in order to see things and that dark is the absence of light. I can see that light is reflected from surfaces. I can recognise that light from the sun can be dangerous and that there are ways to protect my eyes. I can recognise that shadows are formed when the light from a light source is blocked by an opaque object. I can find patterns in the way that the size of shadows change.	**Forces and magnets** I can compare how things move on different surfaces. I can see that some forces need contact between two objects, but magnetic forces can act at a distance. I can observe how magnets attract or repel each other and attract some materials and not others. I can compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. I can describe magnets as having two poles. I can predict whether two magnets will attract or repel each other, depending on which poles are facing
Vocabulary	**Plants** Photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal – wind dispersal, animal dispersal, water dispersal, air, light, water, nutrients, soil, reproduction, transportation, flower	**Animals including humans** Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, support, protect, move, skull, ribs, spine, muscles, joints, movement	**Rocks** Rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, soil, fossil, marble, chalk, granite, sandstone, slate, soil, peat, sandy/chalk/clay soil, absorbent	**Light** Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, reflective, reflection, mirror, sunlight, dangerous	**Forces and magnets** Force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole, friction
Text Links	***The Story of Frog Belly Rat Bone*** *(Timothy Basil Ering)* ***The Hidden Forest*** *(Jeannie Baker)* ***George and Flora's Secret Garden*** *(Jo Elworthy)* 	***Funnybones*** *(Janet and Allan Ahlberg)* ***I Will Never Not Ever Eat a Tomato*** *(Lauren Child)* ***Goldilocks and the Three Bears*** *(Samantha Berger)* 	***The Pebble in My Pocket*** *(Meredith Hooper)* ***Stone Girl, Bone Girl*** *(Laurence Anholt)* ***The Street Beneath My Feet*** *(Charlotte Guillain & Yuval Zommer)* 	***The Owl Who Was Afraid of the Dark*** *(Jill Tomlinson)* ***The Dark*** *(Lemony Snicket)* ***The Firework-Maker's Daughter*** *(Philip Pullman)* 	***The Iron Man*** *(Ted Hughes)* ***Mrs Armitage: Queen of the Road*** *(Quentin Blake)* ***Mr Archimedes' Bath*** *(Pamela Allen)* 

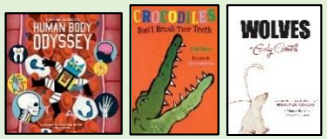
Science Learning Journey

Year 4 Working Scientifically

- I can ask relevant questions and use **different types of scientific enquiries** to answer them.
- I can set up simple practical enquiries, comparative and fair tests.
- I can make systematic and careful observations and take accurate measurements using standard units, using a range of equipment, including thermometers/data loggers.
- I can gather, record, classify and present data in a variety of ways to help answer questions.
- I can record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.
- I can report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.
- I can use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.
- I can identify differences, similarities or changes related to simple scientific ideas/processes.
- I can use straightforward scientific evidence to answer questions.

	Animals including humans	Living Things and their Habitats	States of Matter	Sound	Electricity
Identifying, Grouping and Classifying *Making observations to name, sort and organise items.*	Regular revisit KS1 skills: Exploring and observing the world around them at all times of the year and asking questions about the similarities and differences between things Increased focus on measuring and using data to answer 'big questions'. Continue to build on their observational skills, becoming more independent in identifying, through the use of increasingly complex tools, explaining how they have chosen to group things. Design simple tests to help them classify materials, beginning to use a range of secondary sources with more independence to support them in identifying a range of living things.				
Ideas linked to units	*What are the names for all the organs involved in the digestive system? How can we organise teeth into groups?*	*Can we use the classification keys to identify all the animals that we caught pond dipping?*	*Can you group these materials and objects into solids, liquids, and gases?*	*Can you group these materials by their effectiveness in insulating sound?*	*How would you group these electrical devices based on where the electricity comes from?*
Comparative/Fair Testing *Changing one variable to see its effect on another, whilst keeping all others the same.*	Plan their own tests to collect data gaining increasing independence. Learn to understand the different types of variables: the dependent variable that they will change in their test; the independent variable that they are going to measure so that they can find out how the dependent variable affects it; the control variables which the children will need to keep the same so that they don't affect their results. Use an increasingly wide range of equipment to make measurements and learn what it means to measure accurately and check for reliability. Learn to plan how to record and analyse the data with increasing independence, using tables, pictograms, and bar charts to compare the measurements they make. Use their data to draw conclusions about what they have found out to be the answer to their 'big question'. Begin to think about causal relationships. Evaluate the procedure they used and the quality of their data, suggesting ways they could improve their test. Begin to think about the reliability and accuracy of their data.				
Ideas linked to units	*In our class, are omnivores taller than vegetarians?*	*How does the average temperature of the pond water change in each season?* *Does the amount of light affect how many woodlice move around?*	*Does seawater evaporate quicker than fresh water? How does the surface area of a container of water affect how long it takes to evaporate?*	*Which material is best to use for muffling sound in ear defenders?* *Are two ears better than one?*	*Which metal is the best conductor of electricity? How does the thickness of a conducting material affect how bright the lamp is?*
Pattern Seeking *Identifying patterns and looking for relationships in enquiries where variables are difficult to control.*	Begin to think for themselves when deciding what they should measure and observe. Begin to make decisions about the most appropriate equipment to use to collect data including data loggers. Using data analysis techniques to spot patterns, including using tabulated data and a variety of charts and graphs and begin use this to support their explanations when describing relationships. Use pattern seeking as a preliminary test; use their findings to form and justify their own predictions.				
Ideas linked to units	*Are foods that are high in energy always high in sugar?*	*How has the use of insecticides affected bee population?*	*Is there a pattern in how long it takes different sized ice lollies to melt?*	*Is there a link between how loud it is in school and the time of day? Is it the same in every area of the school?*	*Which room has the most electrical sockets in a house?*
Researching using secondary sources *Using secondary sources of information to answer scientific questions.*	Read for information and note-taking and learn to interpret the information they find and critically consider its relevance in answering their 'big questions'. Use a range of secondary sources, including books, websites, and video to find their information including listening to presentations from experts and science professionals. Find and collect more data in their research, questionnaires/interviews and use this to help answer questions. Begin to evaluate the quality of the information they have found and how well it has enabled them to draw conclusions and answer their 'big question'.				
Ideas linked to units	*How do dentists fix broken teeth?*	*Why are people cutting down the rainforests and what effect does that have?*	*What are hurricanes, and why do they happen?*	*Do all animals have the same hearing range?*	*How does a light bulb work? How has electricity changed the way we live?*
Observing over time *Observing changes that occur over a period of time ranging from minutes to months.*	Explore and talk about their own and other people's scientific ideas, through a range of secondary sources of information, developing their use of scientific language. Begin to recognise how scientific ideas change and develop over time. Explain ideas using their scientific knowledge and understanding using increasingly accurate scientific language.				
Ideas linked to units		*How does the variety of invertebrates on the school field change over the year?*	*How does an egg shell change when it is left in cola?* *How does the level of water in a glass change when left on the windowsill?*	*When is our classroom the quietest?*	*Which material is best for keeping our hot chocolate warm?* *How long does a battery light a torch for?*
Exploring how scientific ideas have changed over time	Explore and talk about their own and other people's scientific ideas Evaluate the significance, strengths and weaknesses of different scientists' ideas.				
Ideas linked to units **Famous Scientists/Inventors:**	*How has a visit to the dentist changed since ancient times?* **Famous Scientists:** Ivan Pavlov (Digestive System Mechanisms) Washington & Lucius Sheffield (Toothpaste in a tube)	*How did **Jane Goodall** learn about the habits and behaviours of chimpanzees and why does she still need to work to protect their habitat?* **Famous Scientists:** Cindy Looy (Environmental Change and Extinction)	*How have scientific tests for predicting the weather changed over time?* **Famous Scientists:** Anders Celsius (Temperature Scale) Daniel Fahrenheit (Temperature Scale/ Invention of the Thermometer)	*Since the 1800s, how has science helped people who are deaf?* **Famous Scientists:** Alexander Graham Bell (Telephone) Aristotle (Sound Waves) James West (Electret Microphone)	*Who actually invented the light bulb, **Thomas Edison** or **Joseph Swan**?* **Famous Scientists:** Thomas Edison (Lightbulb) Joseph Swan (Incandescent Light Bulb)

Science Learning Journey

Year 4	Biology		Chemistry	Physics	
Objectives	**Animals including humans** I can describe the simple functions of the basic parts of the digestive system in humans. I can identify the different types of teeth in humans and their simple functions. I can construct and interpret a variety of food chains, identifying producers, predators and prey.	**Living things and their habitats** I can recognise that living things can be grouped in a variety of ways. I can explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. I can recognise that environments can change and that this can sometimes pose dangers to living things.	**States of matter** I can compare and group materials together, according to whether they are solids, liquids or gases. I can observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in Degrees Celsius. I can identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	**Sound** Identify how sounds are made, associating some of them with something vibrating. I can recognise that vibrations from sounds travel through a medium to the ear. I can find patterns between the pitch of a sound and features of the object that produced it. I can find patterns between the volume of a sound and the strength of the vibrations that produced it. I can recognise that sounds get fainter as the distance from the sound source increases.	**Electricity** I can identify common appliances that run on electricity. I can construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. I can identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery. I can recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. I can recognise some common conductors and insulators, and associate metals with being good conductors.
Vocabulary *Revisit Y1/2/3*	**Animals including humans** Mouth, Tongue, Teeth, Oesophagus, Stomach, Small Intestine, Large Intestine, Rectum, Anus, Canine, Incisor, Molar, Premolars, Food Chain, Producer, Prey, Predator, Omnivore, Carnivore, Herbivore,	**Living things and their habitats** Vertebrates, Fish, Amphibians, Reptiles, Birds, Mammals, Invertebrates, Snails, Slugs, Worms, Spiders, Insects, Environment, Habitats, Classification, Classification Keys, Environment, Habitat, Human Impact, Positive, Negative, Migrate, Hibernate	**States of Matter** Solid, Liquid, Gas, Changing State, Evaporation, Condensation, Particles, Temperature, Melting, Freezing, Heating, Melting/Boiling Point, Water Cycle,	**Sound** Volume, Faint, Loud, Vibration, Wave, Pitch (high/low), Tone, Speaker, Sound, Source, Travel, Insulation	**Electricity** Electricity, Electrical Appliance/Device Mains, Plug, Electrical Circuit, Complete Circuit, Component, Cells, Wires, Bulbs, Switches, Buzzers, Battery, Circuit, Series, Conductors, Insulators, Connect/ Connections, Loose Connections, Metal, Non-Metal, Symbol
Text Links	***Human Body Odyssey*** *(Werner Holzwarth)* ***Crocodiles Don't Brush Their Teeth*** *(Colin Fancy)* ***Wolves*** *(Emily Gravett)* 	***The Vanishing Rainforest*** *(Richard Platt)* ***The Morning I Met a Whale*** *(Michael Morpurgo)* ***Journey to the River Sea*** *(Eva Ibbotson)* 	***Charlie and the Chocolate Factory*** *(Roald Dahl)* ***Once Upon a Raindrop: The Story of Water*** *(James Carter)* ***Sticks*** *(Diane Alber)* 	***Horrid Henry Rocks*** *(Francesca Simon)* ***Moonbird*** *(Joyce Dunbar)* ***The Pied Piper of Hamelin*** *(Natalia Vasquez)* 	***Until I Met Dudley*** *(Roger McGough)* ***Oscar and the Bird: A Book about Electricity*** *(Geoff Waring)* ***Electrical Wizard: How Nikola Tesla Lit Up the World*** *(Elizabeth Rusch)* 

Science Learning Journey

Year 5 Working Scientifically	I can ask relevant questions and use **different types of scientific enquiries** to answer them. I can set up simple practical enquiries, comparative and fair tests. I can make systematic and careful observations and take accurate measurements using standard units, using a range of equipment, including thermometers/data loggers. I can gather, record, classify and present data in a variety of ways to help answer questions. I can record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.	I can report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. I can use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. I can identify differences, similarities or changes related to simple scientific ideas/processes. I can use straightforward scientific evidence to answer questions.			
	Animals including humans	**Living Things and their Habitats**	**Properties and Changes of Materials**	**Earth and Space**	**Forces**
Identifying, Grouping and Classifying *Making observations to name, sort and organise items.*	Regular revisit KS1 skills: Exploring and observing the world around them at all times of the year and asking questions about the similarities and differences between things Increased focus on measuring and using data to answer 'big questions'. Continue to build on their observational skills, becoming more independent in identifying, through the use of increasingly complex tools, as well as developing higher order skills in reasoning and justification when explaining how they have chosen to group things. Design simple tests to help them classify materials, as well as independently using a range of secondary sources to support them in identifying a range of living things.				
Ideas linked to units	*Can you identify all the stages in the human life cycle?*	*Compare this collection of animals based on similarities and differences in their lifecycle.*	*Can you group these materials based on whether they are transparent or not?*	*How could you organise all the objects in the solar system into groups?*	*Can you label and name all the forces acting on the objects in each of these situations?*
Comparative/Fair Testing *Changing one variable to see its effect on another, whilst keeping all others the same.*	Plan their own tests to collect data independently becoming increasingly more systematic. Learn to understand the different types of variables: the dependent variable that they will change in their test; the independent variable that they are going to measure so that they can find out how the dependent variable affects it; the control variables which the children will need to keep the same so that they don't affect their results. Use an increasingly wide range of equipment to make measurements and learn what it means to measure accurately and check for reliability. Learn to independently plan how to record and analyse the data, using tables, pictograms, and bar charts to compare the measurements they make. Measure and record data that can then be displayed in a scatter graph or line graph. Use their data to draw conclusions about what they have found out to be the answer to their 'big question', that also identify causal relationships 'when you increase X, Y will always decrease'.. Evaluate the procedure they used and the quality of their data, suggesting ways they could improve their test and reflecting upon the reliability and accuracy of their data.				
Ideas linked to units	*Who grows the fastest, girls or boys?* *How does age affect a human's reaction time?*	*Which seed shape takes the longest time to fall?*	*Which type of sugar dissolves the fastest?* *How does the temperature of tea affect how long it takes for a sugar cube to dissolve?*	*How does the length of daylight hours change in each season?*	*Which shape parachute takes the longest to fall?* *How does the angle of launch affect how far a paper rocket will go?*
Pattern Seeking *Identifying patterns and looking for relationships in enquiries where variables are difficult to control.*	Begin to think for themselves when deciding what they should measure and observe. Begin to make decisions about the most appropriate equipment to use to collect data including data loggers. Using data analysis techniques to spot patterns, including using tabulated data and a variety of charts and graphs and use this to support their explanations when describing relationships. Use pattern seeking as a preliminary test; use their findings to form and justify their own predictions, then propose further investigations to test these predictions.				
Ideas linked to units	*Are the oldest children in our school the tallest?*	*Is there a relationship between a mammal's size and its gestation period?*	*Do all stretchy materials stretch in the same way?*	*Is there a pattern between the size of a planet and the time it takes to travel around the Sun?*	*Do all objects fall through water in the same way?*
Researching using secondary sources *Using secondary sources of information to answer scientific questions.*	Read for information and note-taking and learn to interpret the information they find and critically consider its relevance in answering their 'big questions'. Use a range of secondary sources, including books, websites, and video to find their information including listening to presentations from experts and science professionals. Find and collect more data in their research, questionnaires/interviews and use this to help answer questions. Evaluate the quality of the information they have found and how well it has enabled them to draw conclusions and answer their 'big question'.				
Ideas linked to units	*Why do people get grey/white hair when they get older?*	*What are the differences between the life cycle of an insect and a mammal?*	*What are microplastics and why are they harming the planet?*	*How have our ideas about the solar system changed over time?*	*How do submarines sink if they are full of air?*
Observing over time *Observing changes that occur over a period of time ranging from minutes to months.*	Explore and talk about their own and other people's scientific ideas, through a range of secondary sources of information, developing their use of scientific language. Begin to recognise how scientific ideas change and develop over time. Explain ideas using their scientific knowledge and understanding using accurate scientific language.				
Ideas linked to units	*How do humans change as they grow older? Human Timelines*	*How do brine shrimp change over their lifetime? How does a bean change as it germinates?*	*How does a container of salt water/nail in salt change over time?*	*How does the moon appear over the period of a month?*	*How long does a pendulum swing for before it stops?*
Exploring how scientific ideas have changed over time	Explore and talk about their own and other people's scientific ideas Evaluate the significance, strengths and weaknesses of different scientists' ideas.				

Science Learning Journey

Ideas linked to units **Famous Scientists/Inventors:**	*How and why has life expectancy in the UK changed since the Middle Ages?* **Famous Scientists:** Alexander Fleming (Penicillin) Louis Pasteur (Vaccination)	*How did the experiments and ideas of **Jan Ingenhousz** help improve our understanding of plants?* **Famous Scientists:** Jan Ingenhousz (Photosynthesis) Sir David Attenborough (Animal Behaviourist)	*What did **Stephanie Kwolek** discover and why was it important?* **Famous Scientists:** Stephanie Kwolek (Chemist – fabric strong enough for bulletproof vest)	*How is astronomer and planetary scientist **Sara Seager** changing our ideas about the universe?* **Famous Scientists:** Neil Armstrong (First man on the Moon) Mae Carol Jemison (First Africa American Women in Space) Margaret Hamilton (Computer scientist Moon Landings) Stephen Hawking (Black Holes) Sara Seager (Life on other planets)	*How have our ideas about gravity changed over time?* **Famous Scientists:** Isaac Newton (Gravity) Albert Einstein (The Theory Of relativity)

Year 5	Biology		Chemistry	Physics	
Objectives	**Animals including humans** I can describe the changes as humans develop to old age.	**Living things and their habitats** I can describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. I can describe the life process of reproduction in some plants and animals.	**Properties and changes of materials** I can compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. I know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. I can use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. I can give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. I can demonstrate that dissolving, mixing and changes of state are reversible changes. I can explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.	**Earth and space** I can describe the movement of the Earth, and other planets, relative to the Sun in the solar system. I can describe the movement of the Moon relative to the Earth. I can describe the Sun, Earth and Moon as approximately spherical bodies. I can use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.	**Forces** I can explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. I can identify the effects of air resistance, water resistance and friction that act between moving surfaces. I can recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.
Vocabulary *Revisit Y1/2/3/4*	Changes, Human, Puberty (more language to be based on PSHE curriculum)	Life Cycle, Reproduce, Sexual, Sperm, Fertilises, Eggs, Live Young, Metamorphosis, Asexual, Plantlets, Runners, Bulbs, Cuttings	Thermal, Electrical Insulator/Conductor, Change of State, Mixture, Dissolve, Solution, Soluble, Insoluble, Sieve, Filter, Reversible/Non-Reversible Change, Burning, Rusting, New Material, Properties, Substance	Earth, Sun, Moon (Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune), Spherical, Sola System, Rotates, Star, Orbit, Planets, Day, Night, Axis, Relation/Relative, Orbit, Star	Force, Gravity, Earth, Air Resistance, Friction, Mechanisms, Simple Machines, Levers, Pulleys, Gears
Text Links	***Letters from the Lighthouse*** *(Emma Carroll)* ***The Gruffalo's Child*** *(Julia Donaldson)* ***The King Who Banned the Dark*** *(Emily Haworth-Booth)* 	***Charlotte's Web*** *(E.B. White)* ***The Land of Neverbelieve*** *(Norman Messenger)* ***Mummy Laid an Egg*** *(Babette Cole)* 	***Itch****(Simon Mayo)* ***Kensuke's Kingdom*** *(Michael Morpurgo)* ***The BFG*** *(Roald Dahl)* ***The Element in the Room*** *(Mike Barfield)* 	***The Skies Above My Eyes*** *(Charlotte Guillain & Yuval Zommer)* ***George's Secret Key to the Universe*** *(Lucy and Stephen Hawking with Christophe Galfard)* ***The Way Back Home*** *(Oliver Jeffers)* 	***The Enormous Turnip*** *(Katie Daynes)* ***Leonardo's Dream*** *(Hans de Beer)* ***The Aerodynamics of Biscuits*** *(Clare Helen Welsh)* 

Science Learning Journey

Year 6 Working Scientifically

- I can ask relevant questions and use **different types of scientific enquiries** to answer them.
- I can set up simple practical enquiries, comparative and fair tests.
- I can make systematic and careful observations and take accurate measurements using standard units, using a range of equipment, including thermometers/data loggers.
- I can gather, record, classify and present data in a variety of ways to help answer questions.
- I can record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.
- I can report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.
- I can use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.
- I can identify differences, similarities or changes related to simple scientific ideas/processes.
- I can use straightforward scientific evidence to answer questions.

	Animals including humans	Evolution and Inheritance	Classification and Variation	Light	Electricity
Identifying, Grouping and Classifying *Making observations to name, sort and organise items.*	Regular revisit KS1 skills: Exploring and observing the world around them at all times of the year and asking questions about the similarities and differences between things Increased focus on measuring and using data to answer 'big questions'. Continue to build on their observational skills, becoming more independent in identifying, through the use of increasingly complex tools, as well as developing higher order skills in reasoning and justification when explaining how they have chosen to group things. Design simple tests to help them classify materials, as well as independently using a range of secondary sources to support them in identifying a range of living things.				
Ideas linked to units	*Which organs of the body make up the circulation system, and where are they found?*	*Compare the skeletons of apes, humans, and Neanderthals* *Can you classify these observations into evidence for the idea of evolution, and evidence against?*	*How would you make a classification key for vertebrates/invertebrates or microorganisms?*	*Can you identify all the colours of light that make white light when mixed together? What colours do you get if you mix different colours of light together?*	*How would you group electrical components and appliances based on what electricity makes them do?*
Comparative/Fair Testing *Changing one variable to see its effect on another, whilst keeping all others the same.*	Plan their own tests to collect data independently becoming increasingly more systematic. Learn to understand the different types of variables: the dependent variable that they will change in their test; the independent variable that they are going to measure so that they can find out how the dependent variable affects it; the control variables which the children will need to keep the same so that they don't affect their results. Use an increasingly wide range of equipment to make measurements and learn what it means to measure accurately and check for reliability. Learn to independently plan how to record and analyse the data, using tables, pictograms, and bar charts to compare the measurements they make. Measure and record data that can then be displayed in a scatter graph or line graph. Use their data to draw conclusions about what they have found out to be the answer to their 'big question', that also identify causal relationships 'when you increase X, Y will always decrease'.. Evaluate the procedure they used and the quality of their data, suggesting ways they could improve their test and reflecting upon the reliability and accuracy of their data.				
Ideas linked to units	*Which type of exercise has the greatest effect on our heart rate?* *How does the length of time we exercise for affect our heart rate?*	*Which type of fruit makes the best fruity battery?*	*Which is the most common invertebrate on our school playing field?*	*Which material is most reflective?* *How does the angle that a light ray hits a plane mirror affect the angle at which it reflects off the surface?*	*Which make of battery lasts the longest? How does the voltage of the batteries in a circuit affect the brightness of the lamp?*
Pattern Seeking *Identifying patterns and looking for relationships in enquiries where variables are difficult to control.*	Begin to think for themselves when deciding what they should measure and observe. Begin to make decisions about the most appropriate equipment to use to collect data including data loggers. Using data analysis techniques to spot patterns, including using tabulated data and a variety of charts and graphs and use this to support their explanations when describing relationships. Use pattern seeking as a preliminary test; use their findings to form and justify their own predictions, then propose further investigations to test these predictions.				
Ideas linked to units	*Is there a pattern between what we eat for breakfast and how fast we can run?*	*Do all flowers have the same number of petals?*	*Is there a pattern between the size and shape of a bird's beak and the food it will eat?*	*Is there a pattern to how bright it is in school over the day? And, if there is a pattern, is it the same in every classroom?*	*Does the temperature of a light bulb go up the longer it is on?*
Researching using secondary sources *Using secondary sources of information to answer scientific questions.*	Read for information and note-taking and learn to interpret the information they find and critically consider its relevance in answering their 'big questions'. Use a range of secondary sources, including books, websites, and video to find their information including listening to presentations from experts and science professionals. Find and collect more data in their research, questionnaires/interviews and use this to help answer questions. Evaluate the quality of the information they have found and how well it has enabled them to draw conclusions and answer their 'big question'.				
Ideas linked to units	*How have our ideas about disease and medicine changed over time?*	*What happened when Charles Darwin visited the Galapagos islands?*	*What do different types of microorganisms do? Are they always harmful?*	*How do astronomers know what stars are made of?* *Why do some people need to wear glasses to see clearly?*	*How has our understanding of electricity changed over time?*
Observing over time *Observing changes that occur over a period of time ranging from minutes to months.*	Explore and talk about their own and other people's scientific ideas, through a range of secondary sources of information, developing their use of scientific language. Begin to recognise how scientific ideas change and develop over time. Explain ideas using their scientific knowledge and understanding using accurate scientific language.				
Ideas linked to units	*How does my heart rate change over the day?* *How much exercise do I do in a week?*	*How do different animal embryos change?*	*What happens to a piece of bread if you leave it on the windowsill for two weeks?*	*How does my shadow change over the day?*	*How would you group electrical components and appliances based on what electricity makes them do?*

Science Learning Journey

Exploring how scientific ideas have changed over time	Explore and talk about their own and other people's scientific ideas Evaluate the significance, strengths and weaknesses of different scientists' ideas.				
Ideas linked to units **Famous Scientists/Inventors:**	*What ideas did Edward Jenner have about small pox and how did he test them?* **Famous Scientists:** Marie Maynard Daly (Cholesterol/sugar on heart) Leonardo Da Vinci (Anatomy) Dr. Katherine Dibb (Expert in Cardiovascular Sciences)	*What ideas did American geneticist Barbara McClintock have about genes that won her a Nobel Prize?* **Famous Scientists** Charles Darwin (Evolution) Alfred Russell Wallace (Naturalist) Rosalind Franklin (DNA)	*How did Carl Linneaus' ideas help us to group plants?* **Famous Scientists** Carl Linneus (Classification) Libby Hyman (Classification Invertebrates)	*Cameras detect light – how has our understanding of light and its effects changed camera design throughout history?* **Famous Scientist:** Patricia Bath (laser probe to treat cataracts) Ibn al-Haytham (Light and our eyes) Thomas Edison (light bulb)	*How have batteries changed over time?* **Famous Scientists:** Nikola Telsa (AC electric system) Alessandro Volta (Electrical Battery)

Year 6	**Biology**			**Chemistry**	**Physics**	
Objectives	**Animals including humans** I can identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. I can recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. I can describe the ways in which nutrients and water are transported within animals, including humans.	**Evolution and inheritance** I can recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. I can recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. I can identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.	**Variation and classification** I can describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro - organisms, plants and animals. I can give reasons for classifying plants and animals based on specific characteristics.		**Light** I can recognise that light appears to travel in straight lines. I can 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. I can explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. I can use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them	**Electricity** I can associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. I can 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. I can use recognised symbols when representing a simple circuit in a diagram.
Vocabulary *Revisit Y1/2/3/4/5*	**Animals including humans** Heart, Pulse, Rate, Pumps, Blood, Blood Vessels, Transported, Lungs, Oxygen, Carbon Dioxide, Nutrients, Water, Muscles, Cycle, Circulatory System, Diet, Exercise, Drugs, Lifestyle	**Evolution and Inheritance** Offspring, Sexual Reproduction, Very, Characteristics, Suited, Adapted, Environment, Inherited, Species, Fossils	**Living things and their habitats** Vertebrates, Fish, Amphibians, Reptiles, Birds, Mammals, Invertebrates, Insects, Spiders, Snails, Worms, Flowering and Non-Flowering Plants		**Light** Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, reflective, reflection, mirror, sunlight, dangerous, Straight Lines, Light Rays	**Electricity** Circuit, Complete Circuit, Circuit Diagram, Circuit Symbol, Cell, Battery, Bulb, Buzzer, Motor, Switch, Voltage, Volt,
Text Links	***Pig-Heart Boy*** *(Malorie Blackman)* ***Skellig*** *(David Almond)* ***A Heart Pumping Adventure*** *(Heather Manley)* 	***One Smart Fish*** *(Christopher Wormell)* ***The Molliebird*** *(Jules Pottle)* ***Our Family Tree*** *(Lisa Westberg Peters)* 	***Beetle Boy*** *(M G Leonard)* ***Insect Soup*** *(Barry Louis Polisar)* ***The Wild Animals of the North*** *(Dieter Braun)* 		***The Light Jar*** *(Lisa Thompson)* ***Why does a Mirror show Things Back to Front?*** *(Anna Claybourne)* ***Tom's Midnight Garden*** *(Philippa Pearce)* 	***The Book of Big Science Ideas*** *(Freya Hardy)* ***The Highland Falcon Thief*** *(M. G. Leonard)* ***How does a Lighthouse Work?*** ***(****Roman Belyaev)*