St Johns Meads Church of England Primary School

SCIENCE CURRICULUM OVERVIEW

Disciplinary Knowledge

St Johns Meads Church of England Primary School

Scientific Enquiry describes the processes and skills pupils should be taught and use, to find out more about the world and how it works. It also includes the methods of enquiry, and the NC encourages pupils to use a variety of (and most appropriate) approaches to answer their questions. These types of scientific enquiry include for:

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<tr><th colspan="3">EYFS</th></tr>
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Make comments about what they have heard and ask questions to clarify their understanding
Work and play cooperatively and take turns with others.
Use and understand recently introduced vocabulary during discussions about science and the world around them
Explore the natural world around them, making observations and drawing pictures of animals and plants.
Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.
Understand some important processes and changes in the natural world around them including the season and changing states of matter.
Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.

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<tr><th>KS1</th><th>LKS2</th><th>UKS2</th></tr>
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Asking simple questions and recognising that they can be answered in different ways
Observing closely, using simple equipment
Performing simple tests
Identifying and classifying
Using their observations and ideas to suggest answers to questions
Gathering and recording data to help in answering questions.

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Asking relevant questions and using different types of scientific enquiries to answer them
Setting up simple practical enquiries, comparative and fair tests
Making systematic observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
Gathering, recording classifying and presenting data in a variety of ways to help in answering questions
Recording findings using simple scientific language, drawing. Labelled diagrams, keys, bar charts and tables
Reporting on finding from enquiries, including oral and written explanations, displays or presentations of results and conclusions
Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
Identifying differences, similarities or changes related to simple scientific ideas and processes
Using straightforward scientific evidence to answer questions or to support their findings

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Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
Taking measurements, using a range of scientific equipment with increasing accuracy and precision
Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graphs
Using test results to make predictions to set up further comparative and fair tests
Using simple models to describe scientific ideas
Reporting and presenting findings from enquiries, including conclusions, casual relationships and explanations of results, in oral and written forms such as displays and other presentations
Identifying scientific evidence that has been used to support or refute ideas or arguments

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St Johns Meads Church of England Primary School

Year 1 Seasons Term 1			
Substantive knowledge	**Sticky knowledge**	**Vocabulary**	**Linked texts**
Observe changes across the four seasons – focus Autumn/ Winter • Observe and describe weather associated with the seasons and how day length varies. • Understand the impact that seasons have on animals and wildlife: Deciduous trees – Evergreen. (Holly, Fir tree) Observe changing colours of leaves (oak, Trees in pavement outside school- classify, Elm.) Observe the variation between leaves- (textures and shapes) Migration- what is this? Which animals migrate? Which animals hibernate? Making connections between all the above.	Weather can change • There are lots of different types of weather: Rain, Sun, Cloud, Wind, Snow, • Days are longer and hotter in the summer • Days are shorter and colder in the winter • There are four seasons: Spring, Summer, Autumn, Winter	Seasons, spring, summer, autumn, winter, windy, sunny, overcast, snow, rain, temperature Dusk, dawn, midday, evening, midnight Deciduous, evergreen, time,	Tree: Seasons Come, Seasons Go (Patricia Hegarty and Britta Teckentrup) Why do leaves fall from tress? (Ruth Owen) The thing called snow (Yuval Zommer) One Year with Kipper (Mick Inkpen) After the Storm (Nick Butterworth)
Prior learning	**Future learning**		
In Early Years children should: • Developing an understanding of change. • Observe and explain why certain things may occur (e.g. leaves falling off trees, weather changes). • Look closely at similarities, differences, patterns and change. • Comments and questions about the place they live or the natural world	In Year 3 children will: • 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 scientists and careers	**Enhancement** **How we exceed the national curriculum**		
	Forest School provides opportunity to observe first hand.		

St Johns Meads Church of England Primary School

Comparative tests *Doing a test*	**identify and classify** *Finding names for things and putting them in groups*	**Observation over time** Looking and measuring more than once.	**Pattern Seeking** Finding patterns	**Research** Reading books and using the computer.	
Autumn- Winter In which season does it rain the most? Gather and record data (Revisit when return to seasons in Summer)	Classify plants that are: Deciduous- evergreen Classify the animals that Hibernate Classify animals that are nocturnal.	How does the colour of a UV bead change over the day? (revisit and compare in summer- link to UV rays and sunscreen) Record temperatures over time (Autumn Winter, revisit in Spring and Summer)	Does the wind always blow the same way? Gather and record data Do seasons affect the tides? How does the length of the day vary?	Are there plants that are in flower in every season? What are they? Research animals that migrate. How do some animals adapt to survive in Winter? (Spring- Big bird watch- observe murmuration- starlings- link to day and night- dusk)	Why do we have seasons in the UK?

St Johns Meads Church of England Primary School

Year 1
Animals including humans
Term 2

Substantive knowledge	Sticky knowledge	Vocabulary	Linked texts
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.	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.	Amphibians, birds, fish, mammals, reptiles, carnivores, herbivore, omnivore, sight, hearing, touch, taste, smell, head, neck, ear, mouth, shoulder, hand, fingers, leg, foot, thumb, eye, nose, knee, toes, teeth, elbow	One Year with Kipper (Mick Inkpen) Snail Trail (Ruth Brown) Superworm (Julia Donaldson & Axel Scheffler

Prior learning	Future learning
In Early Years children should: • be able to identify different parts of their body. • Have some understanding of healthy food and the need for variety in their diets. • Be able to 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	Year 2 children will: • Know that animals, including humans, have offspring which grow into adults • Know 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

St Johns Meads Church of England Primary School

Key scientists and careers			Enhancement How we exceed the national curriculum		
Chris Packham (Animal Conservationist)			Drusillas trip or guest speaker Medical practitioner visit. Forest School		
Comparative tests *Doing a test*	**identify and classify** *Finding names for things and putting them in groups*	**Observation over time** Looking and measuring more than once.	**Pattern Seeking** Finding patterns	**Research** Reading books and using the computer.	
Is our sense of smell better when we cannot see? When we cannot smell does it affect other senses? (taste)	How can we organise all the zoo animals? (Drusillas) What are the names for all the parts of our bodies?	How does my height change over the year?	How is my height different to other year groups in school?	Do all animals have the same senses as humans?	• 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?

St Johns Meads Church of England Primary School

Year 1
Scientists and Inventors
Term 3

Substantive knowledge	Sticky knowledge	Vocabulary	Linked texts
Working Scientifically • Asking simple questions and recognising that they can be answered in different ways • Observing closely, using simple equipment • Performing simple tests • Identifying and classifying • Using their observations and ideas to suggest answers to questions • Gathering and recording data to help in answering questions. **Research** To research facts and information about relevant and appropriate scientists and inventors covering year 1 themes.	Identify the material that 'lego' is made from. Observe and describe properties of plastic Sort animals into 4 groups based on their body parts Name six sensory plants Add information to a pictogram to show their favourite plant Make a rain gauge and use it to measure rainfall. Record rainfall Identify which materials will keep us warm	Materials, plastic, properties, astronaut, space, animals, plants, sensory, pictogram, weather, rain gauge, measure, warm cold, freezing.	Mae Jemison – Little People Big Dreams The Building Boy – Ross Montgomery How to make a Rain Gauge?

Prior learning	Future learning
	• Asking relevant questions and using different types of scientific enquiries to answer them • Setting up simple practical enquiries, comparative and fair tests • Making systematic observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • Gathering, recording classifying and presenting data in a variety of ways to help in answering questions • Recording findings using simple scientific language, drawing. Labelled diagrams, keys, bar charts and tables

			• Reporting on finding from enquiries, including oral and written explanations, displays or presentations of results and conclusions • Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • Identifying differences, similarities or changes related to simple scientific ideas and processes • Using straightforward scientific evidence to answer questions or to support their findings		
Key scientists and careers			**Enhancement** **How we exceed the national curriculum**		
Mae Jemison (First Black women in space) Ole Kirk Christiansen (inventor of Lego) George Mottershead (Opened Chester Zoo) Tim Smit (Inventor of the Eden Project) Christopher Wren (Inventor of the rain gauge) Robert Hooke (Inventor of the rain gauge) Chester Greenwood (Inventor of the earmuffs)			Trip to Lego Land Trip to Druscillas Zoo Visit from a vet Invite pets into school		
Comparative tests *Doing a test*	**identify and classify** *Finding names for things and putting them in groups*	**Observation over time** Looking and measuring more than once.	**Pattern Seeking** Finding patterns	**Research** Reading books and using the computer.	
To gather and record data to help in answering questions	To identify and classify animals To describe and compare the structure of a variety of animals To identify and name a variety of common wild and garden plants	To use observations to suggest answers to questions To observe and describe weather associated with the seasons	To describe the simple physical properties of a variety of everyday materials	To ask simple questions and use simple secondary sources to find answers	Why is Lego made of plastic? What was the impact of Mae Jemison on society? What is the purpose of a zoo? Why do plants smell different? Why do we need to measure rainfall?

St Johns Meads Church of England Primary School

Year 1
Everyday materials
Term 4

Substantive knowledge	Sticky knowledge	Vocabulary	Linked texts
Distinguish between and 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	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 (including glass). • The properties of a material determine whether they are suitable for a purpose	Hard, soft, stretchy, stiff, shiny, dull, rough, smooth, bendy/not bendy, waterproof/not waterproof, absorbent, opaque	The Great Paper Caper (Oliver Jeffers) Who Sank the Boat (Pamela Allen) The Story of Cinderella (Walt Disney)

Prior learning	Future learning
In Early Years children should: • 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.	In Year 2 children will: • 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.
Key scientists and careers	**Enhancement** **How we exceed the national curriculum**
William Addis (Toothbrush Inventor) Charles Mackintosh (Waterproof coat)	Forest School (shelters, clay) Recycling visit or talk Walk on Downs to observe chalk cliffs,

St Johns Meads Church of England Primary School

John McAdam (roads) Alexander Grahem Bell (telephone)			Art link (clay- chalk- flint)		
Comparative tests *Doing a test*	**identify and classify** *Finding names for things and putting them in groups*	**Observation over time** Looking and measuring more than once.	**Pattern Seeking** Finding patterns	**Research** Reading books and using the computer.	
Which materials are the most flexible? Which materials are the most absorbent?	We need to choose a material to make an umbrella. Which materials are waterproof?	What happens to materials over time if we bury them in the ground? In the sea? What happens to shaving foam over time?	Is there a pattern in the types of materials that are used to make objects in a school?	Which materials can be recycled? Why did John McAdam invent macademisation (tarmac)	How can we utilise natural materials? (chalk/ Flint/ clay)

St Johns Meads Church of England Primary School

Year 1
Seasons- Spring and Summer
Term 5

Substantive knowledge	Sticky knowledge	Vocabulary	Linked texts
Observe changes across the four seasons – focus Spring/ Summer • Observe and describe weather associated with the seasons and how day length varies. • Understand the impact that seasons have on animals and wildlife: Deciduous trees – Evergreen. (Holly, Fir tree) Observe changing colours of leaves (oak, Trees in pavement outside school- classify, Elm.) Observe the variation between leaves- (textures and shapes) Migration- what is this? Which animals migrate? Which animals hibernate? Making connections between all the above.	Weather can change • There are lots of different types of weather: Rain, Sun, Cloud, Wind, Snow, • Days are longer and hotter in the summer • Days are shorter and colder in the winter • There are four seasons: Spring, Summer, Autumn, Winter	Seasons, spring, summer, autumn, winter, windy, sunny, overcast, snow, rain, temperature Dusk, dawn, midday, evening, midnight Deciduous, evergreen, time,	Tree: Seasons Come, Seasons Go (Patricia Hegarty and Britta Teckentrup) The Weather Girls (AKI Delphine Mach Elmer and the Rainbow (David McKee) Out and About (Poems) (Shirley Hughes)

Prior learning	Future learning
In Early Years children should: • Developing an understanding of change. • Observe and explain why certain things may occur (e.g. leaves falling off trees, weather changes). • Look closely at similarities, differences, patterns and change. • Comments and questions about the place they live or the natural world	In Year 3 children will: • 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

St Johns Meads Church of England Primary School

Key scientists and careers			Enhancement How we exceed the national curriculum		
			Forest School provides opportunity to observe first hand.		
Comparative tests *Doing a test*	**identify and classify** *Finding names for things and putting them in groups*	**Observation over time** Looking and measuring more than once.	**Pattern Seeking** Finding patterns	**Research** Reading books and using the computer.	
Autumn- Winter In which season does it rain the most? Gather and record data on rainfall compare to term 1 test. Draw conclusion Observe wildlife activity. How is it different to Winter?	Classify plants that are: Deciduous- evergreen Identify and Classify birds seen in Spring Identify and classify flowers and plants	How does the colour of a UV bead change over the day? (revisit and compare in summer- link to UV rays and sunscreen) Record temperatures over time (Autumn Winter, revisit in Spring and Summer) Observe behaviour of animals	Does the wind always blow the same way? Gather and record data Do seasons affect the tides? How does the length of the day vary? Sunrise earlier, warmer temperatures, longer days	Spring- Big bird watch- What is the dawn chorus? Why do birds do this? Is it louder in the Spring? Robin, wren (most common bird and visitor to most gardens) Nest building	Why do we need sunscreen?

St Johns Meads Church of England Primary School

Year 1
Plants
Term 6

Substantive knowledge	Sticky knowledge	Vocabulary	Linked texts
• 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. E.g daffodils, roses, daisy, dandelions, • Identify and name the roots, trunk, branches and leaves of trees	Plants grow from seeds/bulbs • Plants need light and water to grow and survive • Plants are important • We can eat lots of plants	Leaves, trunk, branch, root, seed, bulb, flower, stem, wild, garden, deciduous, evergreen	Tree: Seasons Come, Seasons Go (Patricia Hegarty and Britta Teckentrup) A Little Guide to Wild Flowers (Charlotte Voake) The Things That I LOVE about TREES (Chris Butterworth) Harry's Hazelnut (Ruth Parsons)

Prior learning	Future learning
In EYFS Children should: • Make observations of plants • Know some names of plants, trees and flowers • May be able to name and describe different plants, trees and flowers • Show some care for their world around them	In Year 2 Children will: • 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 scientists and careers	**Enhancement** **How we exceed the national curriculum**
Beatrix Potter (Author & Botanist) Horticultural scientist landscape gardener	Allotment- grow own food

St Johns Meads Church of England Primary School

Comparative tests *Doing a test*	**identify and classify** *Finding names for things and putting them in groups*	**Observation over time** Looking and measuring more than once.	**Pattern Seeking** Finding patterns	**Research** Reading books and using the computer.	
Which type of compost grows the tallest sunflower? Which tree has the biggest Leaves?	How can we sort the leaves that we collected on our walk? (link prior learning deciduous and evergreen)	How does a daffodil bulb change over the year? (link Seasons) How does my sunflower change each week? How does the oak tree change over the year? (link prior learning)	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?	What are the most common British plants and where can we find them? How did Beatrix Potter help our understanding of mushrooms and Toadstools?	**<u>How do Plants grow?</u>** • 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/smelliest (etc) tree/flower/plant on the planet?

St Johns Meads Church of England Primary School

Year 2
Use of Everyday Materials
Term 1

Substantive knowledge	Sticky knowledge	Vocabulary	Linked texts
• 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	Materials can be changed by physical force (twisting, bending, squashing and stretching) Different materials have different functions	Waterproof, fabric, rubber, cars, rock, paper, cardboard, wood, metal, plastic, glass, brick, twisting, squashing, bending, matches, cans, spoons,	The Tin Forest (Helen Ward) Traction Man (Mini Grey) Three Little Pigs

Prior learning	Future learning
In Year 1 children should: • Distinguish between and 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.	In Year 3 children will: • 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

Key scientists and careers	Enhancement How we exceed the national curriculum
William Addis (Toothbrush Inventor) Charles Mackintosh (Waterproof coat) John Macadam (Roads) Isambard Kingdom Brunel (bridges)	Engineer (bridge) speaker RNLI – float/sink/waterproof/buoyancy aids

St Johns Meads Church of England Primary School

Comparative tests *Doing a test*	**identify and classify** *Finding names for things and putting them in groups*	**Observation over time** Looking and measuring more than once.	**Pattern Seeking** Finding patterns	**Research** Reading books and using the computer.	Solving a problem
How does amount of water affect the strength of a kitchen towel? Which material would be best for the roof of the little pig's house? Which materials will float, and which will sink?	Which materials are shiny, and which are dull?	How long do bubble bath bubbles last for? What will happen to our snowman? How do materials change with heat? - leave outside in sunshine/windowsill/ by the radiator	Which shapes make the strongest paper bridge?	How have the materials we use changed over time? How are plastics made?	Can we change materials? How do we choose the best material for the job? Which materials absorb the most water? Which material would be the strongest to use a s a floor tile?

St Johns Meads Church of England Primary School

Year 2
Use of Everyday Materials cont'd
Term 1

Substantive knowledge	Sticky knowledge	Vocabulary	Linked texts
• 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	Materials can be changed by physical force (twisting, bending, squashing and stretching) Different materials have different functions	Waterproof, fabric, rubber, cars, rock, paper, cardboard, wood, metal, plastic, glass, brick, twisting, squashing, bending, matches, cans, spoons,	The Tin Forest (Helen Ward) Traction Man (Mini Grey) Three Little Pigs

Prior learning	Future learning
In Year 1 children should: • Distinguish between and 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.	In Year 3 children will: • 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

Key scientists and careers	Enhancement How we exceed the national curriculum
William Addis (Toothbrush Inventor) Charles Mackintosh (Waterproof coat) John Macadam (Roads) Isambard Kingdom Brunel (bridges)	Engineer (bridge) speaker RNLI – float/sink/waterproof/buoyancy aids

St Johns Meads Church of England Primary School

Comparative tests *Doing a test*	**identify and classify** *Finding names for things and putting them in groups*	**Observation over time** Looking and measuring more than once.	**Pattern Seeking** Finding patterns	**Research** Reading books and using the computer.	
How does amount of water affect the strength of a kitchen towel? Which material would be best for the roof of the little pig's house? Which materials will float, and which will sink?	Which materials are shiny, and which are dull?	How long do bubble bath bubbles last for? What will happen to our snowman? How do materials change with heat? - leave outside in sunshine/windowsill/ by the radiator	Which shapes make the strongest paper bridge?	How have the materials we use changed over time? How are plastics made?	Can we change materials? How do we choose the best material for the job? Which materials absorb the most water? Which material would be the strongest to use a s a floor tile?

St Johns Meads Church of England Primary School

Year 2
Animals including Humans
Term 3

Substantive knowledge	Sticky knowledge	Vocabulary	Linked texts
• Know that animals, including humans, have offspring which grow into adults • Know 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.	Animals move 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.	Living, dead, habitats, micro-habitats, food, food chain, leaf litter, shelter, seashore, woodland, ocean, rainforest, conditions, desert, damp, shade, offspring, life cycle, exercise, hygiene, survival, maturity	Meerkat Mail (Emily Gravett) Tadpole's Promise (Jeanne Willis and Tony Ross)

Prior learning	Future learning
In Year 1 children should: • 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.	In Year 3 children will: • Identify those 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:

St Johns Meads Church of England Primary School

Key scientists and careers			Enhancement How we exceed the national curriculum		
Steve Irwin (Crocodile Hunter) Robert Winston (Human Scientist) Joe Wicks (Personal Trainer)			Trip to the Seven Sisters		
Comparative tests *Doing a test*	**identify and classify** *Finding names for things and putting them in groups*	**Observation over time** Looking and measuring more than once.	**Pattern Seeking** Finding patterns	**Research** Reading books and using the computer.	
Do amphibians have more in common with reptiles or fish? Do bananas make us run faster?	Which offspring belongs to which animal? How would you group things to show which are living, dead, or have never been alive?	How does a tadpole change over time?	Which age group of children wash their hands the most in a day? How much food and drink do I have over a week?	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?	**<u>How and why do we grow and change?</u>** Do living things stay the same? Do bigger animals live longer? Why are we all different heights?

St Johns Meads Church of England Primary School

Year 2
Living things and their Habitats
Term 4

Substantive knowledge	Sticky knowledge	Vocabulary	Linked texts
• Explore and compare the difference 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	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	Living, dead, never alive, habitats, micro-habitats, food, food chain, leaf litter, shelter, seashore, woodland, ocean, rainforest, conditions, desert, damp, shade,	The Gruffalo (Julia Donaldson) Meerkat Mail (Emily Gravett) No Place Like Home (Jonathon Emmett)

Prior learning	Future learning
In Early Years children should: • Comments and questions 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 observed such as plants and animals. • Notices features of objects in their environment. • Comments and asks questions about their familiar world.	In Year 4 children will: • 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 river • Recognise that environments can change and that this can sometimes pose danger to living things.

St Johns Meads Church of England Primary School

Key scientists and careers			Enhancement How we exceed the national curriculum		
Terry Nutkins (TV Presenter) Liz Bonnin (Conservationist) Arthur Tansley(Botanist)			Forestry Commission Guest -Bug Farmers Buglife - conservation		
Comparative tests *Doing a test*	**identify and classify** *Finding names for things and putting them in groups*	**Observation over time** Looking and measuring more than once.	**Pattern Seeking** Finding patterns	**Research** Reading books and using the computer.	
Which pets are the easiest to look after? Is there the same level of light in the evergreen 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 a pond change over the year?	What conditions do woodlice prefer to live in? Which habitat 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? What ideas did botanist Arthur Tansley have about habitats in 1935?	**<u>Why do different animals live in different places?</u>** • 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? • How do seasons affect our animals and plants? • Why do snails hibernate, but slugs do not?

St Johns Meads Church of England Primary School

Year 2
Plants
Term 5

Substantive knowledge	Sticky knowledge	Vocabulary	Linked texts
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	Plants grow from seeds/bulbs • Plants need light, water and warmth to grow and survive • Flowers make seeds to make more plants (reproduce) • Plants are important • We need plants to survive (to clean air, to eat) • We can eat different parts of the plants (leaves, stems, roots, seeds, fruit)	Leaves, trunk, branch, root, seed, bulb, flower, stem, wild, garden, deciduous, evergreen, observe, grow, compare, record, temperature, predict, measure, diagram, germinate, warmth, sunlight.	The Tin Forest (Helen Ward) Jack and the Beanstalk (Richard Walker) Ten Seeds (Ruth Brown) A Seed Is Sleepy (Dianna Aston)

Prior learning	Future learning
In Year 1 Children should: • 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, trunk, branches and leaves of trees.	In Year 3 Children will: • Identify and describe the functions of different parts of the flowering plant: roots, stem/trunk/leaves and flowers • Explore the part flowers play in a flowering plant's life cycle, including pollination, seed formation and seed dispersal • Explain the requirements of plants for life and growth (air, light, water, nutrients from soil, room to grow) and how they vary between plants • Know the way in which water is transported between plants

St Johns Meads Church of England Primary School

Key scientists and careers			Enhancement How we exceed the national curriculum		
Agnes Arber (Botanist) Alan Titchmarsh (Botanist & Gardener)			Plant and take care of year 2 allotment Invite a gardener into school Wilderness Wood Abbots wood Lymley Wood		
Comparative tests *Doing a test*	**identify and classify** *Finding names for things and putting them in groups*	**Observation over time** Looking and measuring more than once.	**Pattern Seeking** Finding patterns	**Research** Reading books and using the computer.	
Do cress seeds grow quicker inside or outside?	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 into bigger plants?	How does a cactus survive in a desert with no water?	What should I do to grow a healthy plant? • 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?

St Johns Meads Church of England Primary School

Year 2
Scientists and Inventors
Term 6

Substantive knowledge	Sticky knowledge	Vocabulary	Linked texts
• To ask simple questions and recognising that they can be answered in different ways • To observe closely, using simple equipment • To perform simple tests • To identify and classify • To use their observations and ideas to suggest answers to questions • To gather and record data to help in answering questions.	Describe things plants need to live Construct a mini greenhouse. Observe how plants grow. Describe when and why we should wash our hands. To appreciate how germs are spread Ask questions and answers about Charles Macintosh and Rachel Carson. Understand where energy comes from.	Biome, botantist, doctor, germs, wind turbine, waterproof, Eden Project	

Prior learning	Future learning
• Asking simple questions and recognising that they can be answered in different ways • Observing closely, using simple equipment • Performing simple tests • Identifying and classifying • Using their observations and ideas to suggest answers to questions • Gathering and recording data to help in answering questions.	• Asking relevant questions and using different types of scientific enquiries to answer them • Setting up simple practical enquiries, comparative and fair tests • Making systematic observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • Gathering, recording classifying and presenting data in a variety of ways to help in answering questions

<table>
<tr><td colspan="3"></td><td colspan="3">

- Recording findings using simple scientific language, drawing. Labelled diagrams, keys, bar charts and tables
- Reporting on finding from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- Identifying differences, similarities or changes related to simple scientific ideas and processes
- Using straightforward scientific evidence to answer questions or to support their findings

</td></tr>
<tr><td colspan="3">Key scientists and careers</td><td colspan="3">Enhancement
How we exceed the national curriculum</td></tr>
<tr><td colspan="3">Tim Smit – Eden project
Nicholas Grimshaw – Biomes for Eden Project
Jane Colden - 1st female Botanist in USA
Elizabeth Garrett Anderson – first qualified female doctor
Louis Pasteur – discovered germs
Charles Macintosh – invented waterproof material
Rachel Carson – studied Ocean Habitats
James Blyth- invented the wind turbine</td><td colspan="3">Guest speaker on wind turbines
Doctor/nurse to talk about germs</td></tr>
<tr><td>Comparative tests
Doing a test</td><td>identify and classify
Finding names for things and putting them in groups</td><td>Observation over time
Looking and measuring more than once.</td><td>Pattern Seeking
Finding patterns</td><td>Research
Reading books and using the computer.</td><td>Solving a problem
???</td></tr>
<tr><td>What is the most suitable material to use as a waterproof coat?</td><td>Identify and describe the basic structures of common flowering plants.</td><td>Why is it important to wash our hands regularly?

How does a plant change in appearance over time?</td><td>Who is the healthiest in the class? And why?</td><td>To find out about people who have developed new materials.

Why are wind turbines a useful invention?</td><td>Are doctors’ scientists?
What is the effect of pollutants on ocean habitats?</td></tr>
</table>

Year 3
Light
Term 1

Substantive knowledge	Sticky knowledge	Vocabulary	Linked texts
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.	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 (reflection). • Shiny materials reflect light beams better than non-shiny materials. • Light comes from a source	Light source, dark, reflect, ray, mirror, bounce, visible, beam, sun, glare, travel, straight, opaque, shadow, block, transparent, translucent.	The Owl Who Was Afraid of the Dark (Jill Tomlinson) The Dark (Lemony Snicket) The Firework-Makers Daughter (Philip Pullman) The Shadow Keeper – Abi Elphinstone

Prior learning	Future learning
In Year 1 children should have: • Observed changes across the four seasons • Observed and describe weather associated with the seasons and how day length varies. Children may: • have some knowledge of were light comes from. • have seen their shadows and may know they appear when it is sunny. • Have some understanding of a reflection. • May understand they need light to be able to see things	In Year 6 children will: • Recognise that light appears to travel in straight lines. • Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye. • Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. • 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 e.g periscope, magnifying glass, microscope

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Key scientists and careers			Enhancement How we exceed the national curriculum		
James Clark Maxwell (Visible and invisible waves of light) Albert Einstein Loius Le Prince Ibn-al-Haytham			Drew Colby hand shadow artist. The Puppet Theatre Barge The Puppet Museum –The Wish Tower - Eastbourne		
Comparative tests *Doing a test*	**identify and classify** *Finding names for things and putting them in groups*	**Observation over time** Looking and measuring more than once.	**Pattern Seeking** Finding patterns	**Research** Reading books and using the computer.	
How does the distance between the shadow puppet and the screen affect the size of the shadow? Which pair of sunglasses will be best at protecting our eyes? How does distance from a light source affect how bright it looks?	How would you organise these light sources into natural and artificial sources?	When is our classroom darkest? Is the Sun the same brightness all day?	Are you more likely to have bad eyesight and to wear glasses if you are older?	How does the Sun make light?	How does the Sun make light? • How does being in darkness affect your sense of hearing? • What colour would be the best to make a safety jacket from? • What would be the best material to make a blind for a baby's room? • How many pieces of tracing paper are as translucent as a single piece of white paper? • How can we change the darkness, size and shape of a shadow?

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Year 3
Forces and Magnets
Term 2

Substantive knowledge	Sticky knowledge	Vocabulary	Linked texts
• 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.	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.	Force, push, pull, friction, surface, magnet, magnetic, magnetic field, pole, north, south, attract, repel, compass	The Iron Man (Ted Hughes) Mrs Armitage: Queen of the Road (Quentin Blake) Mr Archimedes' Bath (Pamela Allen)

Prior learning	Future learning
In Year 2 children: • May have an awareness of how to make things stop and start, using simple pushes and pulls. • They may know about floating and sinking	In Year 5 children will: • 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.

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Key scientists and careers			Enhancement How we exceed the national curriculum		
William Gilbert (Theories on Magnetism) Andre Marie Ampere (Founder of Electro-Magnetism)			Herstmonceux Science Centre London Science Museum		
Comparative tests *Doing a test*	**identify and classify** *Finding names for things and putting them in groups*	**Observation over time** Looking and measuring more than once.	**Pattern Seeking** Finding patterns	**Research** Reading books and using the computer.	
How does the mass of an object affect how much force is needed to make it move? Which surface is best to stop you slipping?	Which materials are magnetic?	If we magnetise a pin, how long does it stay magnetised for?	Do magnetic materials always conduct electricity? Does the size and shape of a magnet affect how strong it is?	How have our ideas about forces changed over time? How does a compass work?	• 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 experience? • How is the magnetic attraction of repulsion force affected by putting materials between the magnets? • How could you use magnets to measure the number of pages in a book?

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Year 3
Animals including humans
Term 3

Substantive knowledge	Sticky knowledge	Vocabulary	Linked texts
• 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:	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.	Nutrients, nutrition, carbohydrates, protein, fats, vitamins, minerals, water, fibre, skeleton, bones, joints, endoskeleton, exoskeleton, hydrostatic skeleton, vertebrates, invertebrates, muscles, contract, relax, protection. support, movement	The Story of Frog Belly Rat Bone (Timothy Basil Ering) Funnybones (Janet and Allan Ahlberg) I Will Never Not Ever Eat a Tomato (Lauren Child)

Prior learning	Future learning
In Year 2 children should: • Know that animals, including humans, have offspring which grow into adults • Know 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	In Year 4 children will: • 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

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Key scientists and careers			Enhancement How we exceed the national curriculum		
Adelle Davis (20th Century Nutritionist) Marie Curie (Radiation / X-Rays) Paramedic, nurse, doctor, dentist, physiotherapist Joe Wickes - Exercise guru			Visiting speaker – radiographer Trip to a leisure centre Guest sports coach or aerobics instructor Film making X-Ray special effects.		
Comparative tests *Doing a test*	**identify and classify** *Finding names for things and putting them in groups*	**Observation over time** Looking and measuring more than once.	**Pattern Seeking** Finding patterns	**Research** Reading books and using the computer.	
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? (from birth to death)	Do male humans have larger skulls that female humans?	Why do different types of vitamins keep us healthy and which foods can we find them in?	Why do we need a skeleton? • Are all skeletons the same? • Can something survive without a skeleton? • What happens if we break a bone? • How do we move? •• Why do we need joints? • Why do muscles get tired? • Can we 'break' muscles?

St Johns Meads Church of England Primary School

Year 3
Rocks and Soils
Term 4

Substantive knowledge	Sticky knowledge	Vocabulary	Linked texts
• 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	• There are different types of rock. • There are different types of soil. • Soils change 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.	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.	The Pebble in My Pocket (Meredith Hooper) Stone Girl, Bone Boy – Laurence Anholt A Rock is Lively – Diana Hutts Aston The Street Beneath My Feet (Charlotte Guillain & Yuval Zommer) The Rock Factory – Jacqui Bailey Lightning Mary – Anthea Simmons

Prior learning	Future learning
In Year 2 children should: • 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. Children may: • May have some understanding of a variety of different rocks in the natural world. • Some understanding of what soil is. (how to identify soil etc) • May have some knowledge of what a fossil is.	In Year 4 children will: • Compare and group materials together, according to whether they are solids, liquids or gases. • 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. Year 6 children will: • Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.

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Key scientists and careers			Enhancement How we exceed the national curriculum		
Mary Anning (Discovery of Fossils) Inge Lehmann (Earth's Mantle)			Guest Speakers Fossil Hunting trip to the beach Bexhill Museum – Fossils and rocks Garden Centre visit		
Comparative tests *Doing a test*	**identify and classify** *Finding names for things and putting them in groups*	**Observation over time** Looking and measuring more than once.	**Pattern Seeking** Finding patterns	**Research** Reading books and using the computer.	
How does adding different amounts of sand to soil affect how quickly water drains through it? Which type of soil absorbs the most water? What rock is best for a kitchen chopping board?	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? What happens when water keeps dripping on a sandcastle?	Is there a pattern in where we find volcanos on planet Earth?	Who was Mary Anning and what did she discover?	What are rocks and soils like? • Which soil type is more likely to lead to flooding? • How might the soil be different in different countries? • How do rocks change? • Why do you think worms are important to the creation of soil? • How can we use composting to make our own soil? • How are fossils created? • Why do fossils help us find out about historical events?

St Johns Meads Church of England Primary School

Year 3
Plants
Term 5

Substantive knowledge	Sticky knowledge	Vocabulary	Linked texts
• Identify and describe the functions of different parts of the flowering plant: roots, stem/trunk/leaves and flowers • Explore the part flowers play in a flowering plants life cycle, including pollination, seed formation and seed dispersal • Explain the requirements of plants for life and growth (air, light, water, nutrients from soil, room to grow) and how they vary between plants • Know the way in which water is transported between plants	Plants are producers, they make their own food. • Their leaves absorb sunlight and carbon dioxide • Plants have roots, which provide support and draw water from the soil • Flowering plants have specific adaptations which help it to carry out pollination, fertilisation and seed production • Seed dispersal improves a plant's chances of successful reproduction • Seeds/bulbs require the right conditions to germinate and grow. • Seeds contain enough food for the plant's initial growth	Air, light, water, nutrients, soil, support, anchor, reproduction, pollination, dispersal, transportation, flower, energy, growth, seedling, carbon dioxide, oxygen, sugar, material, photosynthesis, chlorophyll	The Hidden Forest (Jeannie Baker) George and Flora's Secret Garden (Jo Elworthy

Prior learning	Future learning
In Year 2 Children should: • 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	In Year 6 Children will: • Recognise that living things have changed over time and that fossils provide information about living things • Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents • Identify how animals and plants are adapted to suit their environment in different ways, and that adaptation can lead to evolution

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Key scientists and careers	Enhancement How we exceed the national curriculum
Jan Ingenhousz (Photosynthesis) Joseph Banks (Botanist)	Kew Gardens/Sheffield Park/Nymans Birling Gap and Seven Sisters Gardens in Bloom Horticulturalists visit speaker

Comparative tests *Doing a test*	**identify and classify** *Finding names for things and putting them in groups*	**Observation over time** Looking and measuring more than once.	**Pattern Seeking** Finding patterns	**Research** Reading books and using the computer.	
How does the length of the carnation stem affect how long it takes for the food colouring to dye the petals? Which conditions help seeds germinate faster?	How many ways can you group our seed collection	What happens to celery when it is left in a glass of coloured water? How do flowers in a vase change over time	What colour flowers do pollinating insects prefer?	What are all the different ways that seeds disperse	Why do plants have flowers?

St Johns Meads Church of England Primary School

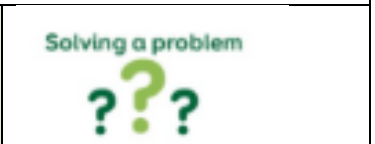
Year 3
Scientists and Inventors
Term 6

Substantive knowledge	Sticky knowledge	Vocabulary	Linked texts
• Asking relevant questions and using different types of scientific enquiries to answer them • Setting up simple practical enquiries, comparative and fair tests • Making systematic observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • Gathering, recording classifying and presenting data in a variety of ways to help in answering questions • Recording findings using simple scientific language, drawing. Labelled diagrams, keys, bar charts and tables • Reporting on finding from enquiries, including oral and written explanations, displays or presentations of results and conclusions • Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • Identifying differences, similarities or changes related to simple scientific ideas and processes • Using straightforward scientific evidence to answer questions or to support their findings	• match facts to the names of four people who brought new plants to Britain; • Give 5 facts about Marie Curie's life and work; • share facts about William Smith life and work and how he found fossils; • give four facts about Inge Lehmann's life and work; • identify devices and inventions that use curved mirrors; • describe electromagnets as magnets powered by electricity; • describe how the first electromagnets were developed and name a scientist who worked on them; • recognise that inventions and discoveries come from all over the world; • research an invention to make people's lives easier.	Seismology, geology, botanist, magna, concave, convex, electromagnetic radiation, nickel, fossils	

Prior learning	Future learning
• Asking simple questions and recognising that they can be answered in different ways	• Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • Taking measurements, using a range of scientific equipment with increasing accuracy and precision

• Observing closely, using simple equipment • Performing simple tests • Identifying and classifying • Using their observations and ideas to suggest answers to questions • Gathering and recording data to help in answering questions.	• Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graphs • Using test results to make predictions to set up further comparative and fair tests • Using simple models to describe scientific ideas • Reporting and presenting findings from enquiries, including conclusions, casual relationships and explanations of results, in oral and written forms such as displays and other presentations • Identifying scientific evidence that has been used to support or refute ideas or arguments

Key scientists and careers	**Enhancement** **How we exceed the national curriculum**
Sir Joseph Banks – introduced 80 new species of plants David Douglas – botanist Jeanne Baret – Introduced 70 plants to Europe Tom Hart Dyke – plant hunter Marie Curie – developed X rays George Washington Carver – discovered 100+ uses of a peanut William Smith – Geologist and studied fossils Inge Lehmann – seismologist and earthquake.	Garden Centres visit/guest Fossil hunt on the beach = Beach School Radiologists visit

Comparative tests *Doing a test*	**identify and classify** *Finding names for things and putting them in groups*	**Observation over time** Looking and measuring more than once.	**Pattern Seeking** Finding patterns	**Research** Reading books and using the computer.	
To investigate how images change in concave and convex mirrors To explore how elector magnets attract some materials.	To explain how Marie Curie's work on X-rays help us to identify bones. To describe what Inge Lehmann discovered about the Earth's core.	To explain how George Washington helped farmers to grow crops.	To explain how fossils can be used to find the age of rocks.	To find out about the way new plants arrived in our country To identify inventions and discoveries from all over the world linked to scientific ideas.	Who and how were new species of plants introduced to our country? What impact did Marie Curie have to medical history? Who is William Smith? What did Inge Lehmann discover?

St Johns Meads Church of England Primary School

Year 4
States of Matter
Term 1

Substantive knowledge	Sticky knowledge	Vocabulary	Linked texts
Compare and group materials together, according to whether they are solids, liquids or gases. • 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.	• Solids, liquids and gases are described by observable properties. • Materials can be divided into solids, liquids and gases. • Heating causes solids to melt into liquids and liquids evaporate into gases. d) Cooling causes gases to condense into liquids and liquids to freeze into solids. • The temperature at which given substances change state are always the same.	Solid, liquid, gas, particles, state, materials, properties, matter, melt, freeze, water, ice, temperature, process, condensation, evaporation, water vapour, energy, precipitation, collection	Once Upon a Raindrop: The Story of Water (James Carter) Sticks (Diane Alber)

Prior learning	Future learning
In KS1 children should: • Distinguish between an object and the material from which it is made. • Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. • Describe the simple physical properties of a variety of everyday materials. • Compare and group together a variety of everyday materials based on their simple physical properties. • Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. • Find out how the shapes of solid objects made from some materials can be changed by sq	In Year 5 children will: • Compare and group together everyday materials based on their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. • Know that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution. • Use knowledge of solids, liquids, and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. • Give reasons based on evidence from comparative and fair tests, for the 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

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Key scientists and careers			Enhancement How we exceed the national curriculum		
Anders Celsius (Celsius Temperature Scale) Daniel Fahrenheit (Fahrenheit Temperature Scale / Invention of the Thermometer)					
Comparative tests *Doing a test*	**identify and classify** *Finding names for things and putting them in groups*	**Observation over time** Looking and measuring more than once.	**Pattern Seeking** Finding patterns	**Research** Reading books and using the computer.	
How does the mass of a block of ice affect how long it takes to melt? How does the surface area of water affect how long it takes to evaporate? Does seawater evaporate faster than fresh water?	Can you group these materials and objects into solids, liquids, and gases? How would you sort these objects/materials based on their temperature?	Which material is best for keeping our hot chocolate warm? How does the level of water in a glass change when left on the windowsill?	Is there a pattern in how long it takes different sized ice lollies to melt? How does evaporation rate change as you add more salt to your water?	What are hurricanes, and why do they happen?	Where do ice cubes go when they disappear? Why does it rain and hail? 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? • Place a peach in a glass of lemonade and watch it spin. Why does it behave that way, and can you prove it? • How does the material sprinkled on ice and snow affect how quickly it melts? • How does the type of chocolate affect its melting temperature?

St Johns Meads Church of England Primary School

Year 4
Electricity
Term 2

Substantive knowledge	Sticky knowledge	Vocabulary	Linked texts
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	A source of electricity (mains of battery) is needed for electrical devices to work. • Electricity sources push electricity round a circuit. • 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 easily and these are called conductors. Materials that don't allow electricity to flow easily are called insulators	Electricity, electric current, appliances, mains, crocodile clips, wires, bulb, battery cell, battery holder, motor, buzzer, switch, conductor, electrical insulator, component	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

Prior learning	Future learning
In Early Years children: • May have some understanding that objects need electricity to work. • May understand that a switch will turn something on or off.	In Year 6 children will: • Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. • Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. • Use recognised symbols when representing a simple circuit in a diagram.

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Key scientists and careers			Enhancement How we exceed the national curriculum		
Thomas Edison (First Working Lightbulb) Joseph Swan (Incandescent Light Bulb					
Comparative tests *Doing a test*	**identify and classify** *Finding names for things and putting them in groups*	**Observation over time** Looking and measuring more than once.	**Pattern Seeking** Finding patterns	**Research** Reading books and using the computer.	
How does the thickness of a conducting material affect how bright the lamp is? Which metal is the best conductor of electricity	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? How does a light bulb work?	What can we do with electricity?

St Johns Meads Church of England Primary School

Year 4
Sound
Term 3

Substantive knowledge	Sticky knowledge	Vocabulary	Linked texts
Know how sound is made associating some of them with 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	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 (higher frequencies) produce higher pitched sounds	Amplitude, volume, quiet, loud, ear, pitch, high, low, particles, instruments, wave, vibrates, vibrations, frequency	Horrid Henry Rocks (Francesca Simon) Moonbird (Joyce Dunbar) The Pied Piper of Hamelin (Natalia Vasquez)

Prior learning	Future learning
In KS1 children: • May have some understanding that objects make different sounds. • Some understanding that they use their ears to hear sounds. • Know about their different senses	In KS3 children will learn about: • frequencies of sound waves measured in hertz (Hz), echoes, reflection and absorption of sound • sound needs a medium to travel, the speed of sound in air, in water, in solids • sound produced by vibrations of objects, in loudspeakers, detected by their effects on microphone diaphragm and the ear drum; sound waves are longitudinal • auditory range of humans and animals

St Johns Meads Church of England Primary School

Key scientists and careers			Enhancement How we exceed the national curriculum		
Aristotle (Sound Waves) Gailileo Galilei (Frequency and Pitch of Sound Waves) Alexander Graham Bell (Invented the Telephone)			Visit to or from a radio station Guest speaker – Hearing Support Unit Music specialist		
Comparative tests *Doing a test*	**identify and classify** *Finding names for things and putting them in groups*	**Observation over time** Looking and measuring more than once.	**Pattern Seeking** Finding patterns	**Research** Reading books and using the computer.	
How does the volume of a drum change as you move further away from it? How does the length of a guitar string/tuning fork affect the pitch of the sound? How does the type of material affect how well is blocks a sound? Which materials make the best string telephone components? (tin cans, paper cups, plastic cups, wire	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? If there is a pattern, is it the same in every area of the school? Which materials vibrate better and produce louder sounds? Can we identify any patterns?	Do all animals have the same hearing range?	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 thickness of material affect how well it blocks a sound? • Can you predict the relative pitch of tuning forks from the patterns of ripples they make in the water?

St Johns Meads Church of England Primary School

Year 4
All Living Things
Term 4

Substantive knowledge	Sticky knowledge	Vocabulary	Linked texts
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.	Living things can be divided into groups based upon their characteristics • Environmental change affects different habitats differently • Different organisms are affected differently by environmental change • Different food chains occur in different habitats • Human activity significantly affects the environment	Environment, flowering, nonflowering, plants, animals, vertebrates, fish, amphibians, reptiles, mammals, invertebrate, human impact, nature reserves, deforestation	The Vanishing Rainforest (Richard Platt) The Morning I Met a Whale (Michael Morpurgo) Journey to the River Sea (Eva Ibbotson)

Prior learning	Future learning
In Year 2, children should: • Explore and compare the difference 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	In Year 5: • 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

Key scientists and careers	Enhancement How we exceed the national curriculum
Cindy Looy (Environmental Change and Extinction) Jaques Cousteau (Marine Biologist)	Trip to Sea life centre Talk by RSPCA

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Comparative tests *Doing a test*	**identify and classify** *Finding names for things and putting them in groups*	**Observation over time** Looking and measuring more than once.	**Pattern Seeking** Finding patterns	**Research** Reading books and using the computer.	
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?	Are living things in danger? • What food chains and webs are there in our local habitat? • How does energy move through the food chain? • How does removal of one species from an environment, affect others? (keystone species) • How does environmental change affect different organisms? • What are the most important things we could do to improve our outside area? (big hotels, pond, compost, wildflowers) • How does human activity affect our environment (ferries on the Solent?

St Johns Meads Church of England Primary School

Year 4
Animals including Humans
Term 5

Substantive knowledge	Sticky knowledge	Vocabulary	Linked texts
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	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 then to secondary consumers through food chains.	Herbivore, Carnivore, Digestive system, tongue, mouth, teeth, oesophagus, stomach, gall bladder, small intestine, pancreas, large intestine, liver, tooth, canine, incisor, molar, premolar, producer, consumer.	Human Body Odyssey (Werner Holzwarth) Crocodiles Don't Brush Their Teeth (Colin Fancy) Wolves (Emily Gravett)

Prior learning	Future learning
In Year 3 children should: • Identify that animals, includeing 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	In Year 5 children will: • Know the life cycle of different living things, e.g. Mammal, amphibian, insect bird. • Know the differences between different life cycles. • Know the process of reproduction in plants. • Know the process of reproduction in animals

St Johns Meads Church of England Primary School

Key scientists and careers			Enhancement How we exceed the national curriculum		
Ivan Pavlov (Digestive System Mechanisms) Joseph Lister (Discovered Antiseptics)			Talk by a nutritionist Talk by a doctor/diabetic nurse Invite chef in to school Liaise with School Dinner Suppliers Link with Pizza/Dominoes to make Pizza		
Comparative tests *Doing a test*	**identify and classify** *Finding names for things and putting them in groups*	**Observation over time** Looking and measuring more than once.	**Pattern Seeking** Finding patterns	**Research** Reading books and using the computer.	
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?	What do our bodies do with the food we eat? • Why do we need a variety of different foods? • Do all organisms eat the same things? • Why are teeth important? • What is our digestive system? • How does our food turn into poo and wee?

St Johns Meads Church of England Primary School

Year 4
Scientists and Inventors
Term 6

Substantive knowledge	Sticky knowledge	Vocabulary	Linked texts
• Asking relevant questions and using different types of scientific enquiries to answer them • Setting up simple practical enquiries, comparative and fair tests • Making systematic observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • Gathering, recording classifying and presenting data in a variety of ways to help in answering questions • Recording findings using simple scientific language, drawing. Labelled diagrams, keys, bar charts and tables • Reporting on finding from enquiries, including oral and written explanations, displays or presentations of results and conclusions • Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • Identifying differences, similarities or changes related to simple scientific ideas and processes • Using straightforward scientific evidence to answer questions or to support your findings	Describe the dangers of deforestation in Madagascar. Research facts about Alexander Graham Bell's life and work. Describe the achievements of Maria Telkes and appreciate why solar power is a good source of energy. Discuss the life and times of Garrett Morgan and build some traffic lights using a simple series circuit. Sort some facts about the scientists who discovered oxygen. Explore Lord Kelvins work on temperature. Explain how inventions like the light bulb have changed people's lives.	Conservationist, telephone, microphone, solar power, modern gas mask, traffic lights, oxygen, carbon filament, electricity, toothpaste, temperature, absolute zero. Respiration. Lightbulb.	

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Prior learning	Future learning
• Asking simple questions and recognising that they can be answered in different ways • Observing closely, using simple equipment • Performing simple tests • Identifying and classifying • Using their observations and ideas to suggest answers to questions • Gathering and recording data to help in answering questions.	• Different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • Taking measurements, using a range of scientific equipment with increasing accuracy and precision • Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graphs • Using test results to make predictions to set up further comparative and fair tests • Using simple models to describe scientific ideas • Reporting and presenting findings from enquiries, including conclusions, casual relationships and explanations of results, in oral and written forms such as displays and other presentations • Identifying scientific evidence that has been used to support or refute ideas or arguments

Key scientists and careers	Enhancement How we exceed the national curriculum
Gerald Durrell (conservationist) Alexander Graham Bell (inventor of the telephone) Maria Telkes Solar Power) Garrett Morgan (Modern Gas Mask/ traffic Lights) Antoine Lavoisier and Joseph Priestley (discovered Oxygen) Lesley Howard Latimer (Modern Lightbulb) Thomas Edison (electricity) Washington Sheffield (toothpaste) Lord Kelvin (absolute zero)	Guest conservationist Dentist Electrician

Comparative tests *Doing a test*	**identify and classify** *Finding names for things and putting them in groups*	**Observation over time** Looking and measuring more than once.	**Pattern Seeking** Finding patterns	**Research** Reading books and using the computer.	
To compare the erosion properties of different soils.	To compare and group materials together according to whether	To build a solar oven and observe how the	To recognise that a switch open and closes	To explore deforestation in Madagascar.	What can we discover about certain inventors

	they are solids liquids or gases. To identify common electrical appliances that run on electricity. To identify ways to look after our teeth.	temperature changes inside it. To observe that some materials change state when they are heated or cooled.	a simple series circuit	Discover facts about Alexander Graham Bell	and how their inventions impacted our modern way of life?

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Year 5
Forces
Term 1

Substantive knowledge	Sticky knowledge	Vocabulary	Linked texts
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.	• 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 force against motion caused by two surfaces rubbing against each other. • Some objects require large forces to make them move; gears, pulley and levers can reduce the force needed to make things move	Air resistance, Water resistance, Friction, Gravity, Newton, Gears, Pulleys, force, push, pull, opposing, streamline, brake, mechanism, lever, cog, machine, pulley.	The Enormous Turnip (Katie Daynes) Leonardo's Dream (Hans de Beer) The Aerodynamics of Biscuits (Clare Helen Welsh)

Prior learning	Future learning
In Year 3 children should: • 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.	In KS3 children will learn about: • opposing forces and equilibrium: weight held by stretched spring or supported on a compressed surface • forces being needed to cause objects to stop or start moving, or to change their speed or direction of motion (qualitative only) • change depending on direction of force and its size

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Key scientists and careers			Enhancement How we exceed the national curriculum		
Galileo Galilei (Gravity and Acceleration) Isaac Newton (Gravitation) Archimedes of Syracuse (Levers) John Walker (The Match)					
Comparative tests *Doing a test*	**identify and classify** *Finding names for things and putting them in groups*	**Observation over time** Looking and measuring more than once.	**Pattern Seeking** Finding patterns	**Research** Reading books and using the computer.	
How does the angle of launch affect how far a paper rocket will go? How does the surface area of an object affect the time it takes to sink? • How does adding holes to a parachute affect the time it takes to fall? How does changing the shape of a piece of plasticine affect water resistance?	Can you label and name all the forces acting on the objects in each of these situations?	How long does a pendulum swing for before it stops?	Do all objects fall through water in the same way? How does surface area of parachute affect the time it takes to fall?	How do submarines sink if they are full of air?	How and why do objects move? • How can we see/measure forces? • How does the saltiness (salinity) of water affect the water resistance? • What is the most effective way to move an object? • How do see-saws work? • Can you create a pulley system to lift a given load?

St Johns Meads Church of England Primary School

Year 5
Animals including Humans
Term 2

Substantive knowledge	Sticky knowledge	Vocabulary	Linked texts
Describe the changes as humans develop to old age.	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 reproduction • Hormones control these changes, which can be physical and/or emotional.	Foetus, Embryo, Womb, Gestation, Baby, Toddler, Teenager, Elderly, Growth, Development, Puberty, Hormone, Physical, Emotional,	Hair in Funny Places (Babette Cole) Giant (Kate Scott) You're Only Old Once! (Dr. Seuss)

Prior learning	Future learning
In Year 4 children should: • 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.	In Year 6: • 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.

St Johns Meads Church of England Primary School

Key scientists and careers			Enhancement How we exceed the national curriculum		
Dr Steve Jones (Geneticist) Prof Robert Winston (Human Scientist)					
Comparative tests *Doing a test*	**identify and classify** *Finding names for things and putting them in groups*	**Observation over time** Looking and measuring more than once.	**Pattern Seeking** Finding patterns	**Research** Reading books and using the computer.	
How does age affect a human's reaction time? Who grows the fastest, girls or boys?	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? Do all animal embryos look the same?	Why and how does the human body change over time? What do humans look like? • • What changes do we go through during puberty?

St Johns Meads Church of England Primary School

Year 5
Earth and Space
Term 3

Substantive knowledge	Sticky knowledge	Vocabulary	Linked texts
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.	• 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.	Earth, Sun, Moon, Axis, Rotation, Day, Night, Phases of the Moon, star, constellation, waxing, waning, crescent, gibbous. Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, planets, solar system, day, night, rotate, orbit, axis, spherical, geocentric, heliocentric.	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)

Prior learning	Future learning
In Key Stage 1 and in Year 3 children should: • 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	In KS3 children will learn about: • 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 Sun (qualitative only) • Our Sun as a star, other stars in our galaxy, other galaxies • The 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

St Johns Meads Church of England Primary School

Key scientists and careers			Enhancement How we exceed the national curriculum		
laudius Ptolemy and Nicolaus Copernicus (Heliocentric vs Geocentric Universe) Neil Armstrong (First man on the Moon) Helen Sharman (First British astronaut) Tim Peake (First British ESA astronaut)			Herstmonceux Science Centre London Science Museum		
Comparative tests *Doing a test*	**identify and classify** *Finding names for things and putting them in groups*	**Observation over time** Looking and measuring more than once.	**Pattern Seeking** Finding patterns	**Research** Reading books and using the computer.	
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 phases 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? How do astronomers know what stars are made of? How have our ideas about the solar system changed over time?	The Sun, Earth & Moon: What is moving and how do we know?

St Johns Meads Church of England Primary School

Year 5
Living Things and their Habitats
Term 4

Substantive knowledge	Sticky knowledge	Vocabulary	Linked texts
• Know the life cycle of different living things, e.g. Mammal, amphibian, insect bird. • Know the process of reproduction in plants. • Know the process of reproduction in animals	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.	Reproduction, Sexual, Asexual, Pollination, Dispersal, reproduction, cell, fertilisation, pollination, male, female, pregnancy, young, mammal, metamorphosis, amphibian, insect, egg, embryo, bird, plant	The Land of Neverbelieve (Norman Messenger) Mummy Laid an Egg (Babette Cole)

Prior learning	Future learning
In Year 4 children should: • Construct and interpret a variety of food chains, identifying producers, predators and prey • 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.	In Year 6: • 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.

St Johns Meads Church of England Primary School

Key scientists and careers			Enhancement How we exceed the national curriculum		
James Brodie of Brodie (Reproduction of Plants by Spores) David Attenborough (Naturalist and Nature Documentary Broadcaster)					
Comparative tests *Doing a test*	**identify and classify** *Finding names for things and putting them in groups*	**Observation over time** Looking and measuring more than once.	**Pattern Seeking** Finding patterns	**Research** Reading books and using the computer.	
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? How does a bean change as it germinates?	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?	Do all plants and animals reproduce in the same way? What is a life cycle? • Do plants reproduce in the same ways as us? • How do plants spread their seeds?

St Johns Meads Church of England Primary School

Year 5
Scientists and Inventors
Term 5

Substantive knowledge	Sticky knowledge	Vocabulary	Linked texts
• Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • Taking measurements, using a range of scientific equipment with increasing accuracy and precision • Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graphs • Using test results to make predictions to set up further comparative and fair tests • Using simple models to describe scientific ideas • Reporting and presenting findings from enquiries, including conclusions, casual relationships and explanations of results, in oral and written forms such as displays and other presentations • Identifying scientific evidence that has been used to support or refute ideas or arguments	Explain whether evidence supports or refutes ideas Use chromatography to separate mixturesse results to make new predictions Order fats aboy Stephanie Kwoleks life	Biology, chemistry, Physics, Physicist, naturalist, chromatography, DNA, geology, technicians, fingerprints, mission, astronauts, orbits, dwarf plaets, asteroids, Stonehenge, astronomy	

Prior learning	Future learning
• Asking relevant questions and using different types of scientific enquiries to answer them • Setting up simple practical enquiries, comparative and fair tests • Making systematic observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • Gathering, recording classifying and presenting data in a variety of ways to help in answering questions • Recording findings using simple scientific language, drawing. Labelled diagrams, keys, bar charts and tables • Reporting on finding from enquiries, including oral and written explanations, displays or presentations of results and conclusions • Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • Identifying differences, similarities or changes related to simple scientific ideas and processes • Using straightforward scientific evidence to answer questions or to support their findings	• Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • Taking measurements, using a range of scientific equipment with increasing accuracy and precision • Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graphs • Using test results to make predictions to set up further comparative and fair tests • Using simple models to describe scientific ideas • Reporting and presenting findings from enquiries, including conclusions, casual relationships and explanations of results, in oral and written forms such as displays and other presentations • Identifying scientific evidence that has been used to support or refute ideas or arguments

St Johns Meads Church of England Primary School

Key scientists and careers			Enhancement How we exceed the national curriculum		
David Attenborough (naturalist) Eva Crane (physicist/bees) Stephan Kwolek (inventor of Kevlar) Leonardo Da Vinci (scientist) Margaret Hamilton (Worked for NASA) Neil deGrasse Tyson (planetary Scientist) Jane Goodall (animal behaviouralist/conservationist)			Bee Keeper visit and talk Port Lympne Safari Park		
Comparative tests *Doing a test*	**identify and classify** *Finding names for things and putting them in groups*	**Observation over time** Looking and measuring more than once.	**Pattern Seeking** Finding patterns	**Research** Reading books and using the computer.	Solving a problem
	To identify a mixture by analysing its components Identify the largest and smallest planets in the solar system	How have scientific ideas changed over time? To describe the life processes of reproduction in some plants and animals e.g. bees	How is evidence used to solve crimes?	Explain how Margaret Hamiltons software inventions changed the way computer programmes were used. To find out about the work of naturalists and conservationists.	What were Neil deGrasse's ideas about Pluto? How do we know if Stonehenge was used an astronomical calendar What is the life cycle of the bee?

St Johns Meads Church of England Primary School

Year 5
Properties and changes of materials
Term 6

Substantive knowledge	Sticky knowledge	Vocabulary	Linked texts
Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. • 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.	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	Solid, liquid, gas, particles, state, materials, properties, matter, melt, freeze, water, ice, temperature, process, condensation, evaporation, water vapour, energy, precipitation, collection,	Itch (Simon Mayo) Kensuke's Kingdom (Michael Morpurgo) The BFG (Roald Dahl)

Prior learning	Future learning
In KS1 children should: • Distinguish between an object and the material from which it is made. • Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. • Describe the simple physical properties of a variety of everyday materials. • Compare and group together a variety of everyday materials based on their simple physical properties. • Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. • Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	In Year 6 children will: • Compare and group together everyday materials based on their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), 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

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Key scientists and careers			Enhancement How we exceed the national curriculum		
Spencer Silver et al (post it notes) Ruth Benerito (wrinkle-free cotton)					
Comparative tests *Doing a test*	**identify and classify** *Finding names for things and putting them in groups*	**Observation over time** Looking and measuring more than once.	**Pattern Seeking** Finding patterns	**Research** Reading books and using the computer.	
How does the temperature of tea affect how long it takes for a sugar cube to dissolve? Which type of sugar dissolves the fastest?	Can you group these materials based on whether they are transparent or not?	How does a container of saltwater change over time? How does a sugar cube change as it is put in a glass of water?	Do all stretchy materials stretch in the same way? How does temperature affect how much solute we can dissolve?	What are microplastics and why are they harming the planet?	How can we separate a mixture of water, iron filings, salt and sand? • Which of the following dissolve in water: sugar, bicarbonate of soda, oil, chocolate, coffees, dark vinegar and wax? • Which sweets dissolve in water? • How can we clean our dirty water?

St Johns Meads Church of England Primary School

Year 6
Animals including humans
Term 1

Substantive knowledge	Sticky knowledge	Vocabulary	Linked texts
• 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 body's function. • Describe the ways in which nutrients and water are transported within animals, including humans.	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. (Oxygen is taken into the blood in the lungs; the heart pumps the blood through blood vessels to the muscles; the muscles take oxygen and nutrients from the blood.)	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.	Pig-Heart Boy (Malorie Blackman) Skellig (David Almond) A Heart Pumping Adventure (Heather Manley)

Prior learning	Future learning
In Year 5 children should: • Describe the changes as humans develop to old age.	In Key Stage 3 children will learn about: • 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 food (enzymes simply as biological catalysts) • calculations of energy requirements in a healthy daily diet • the consequences of imbalances in the diet, including obesity, starvation and deficiency diseases • the structure and functions of the gas exchange system in humans, including adaptations to function • the effects of recreational drugs (including substance misuse) on behaviour, health and life processes.

St Johns Meads Church of England Primary School

Key scientists and careers			Enhancement How we exceed the national curriculum		
Justus von Liebig (Theories of Nutrition and Metabolism) Sir Richard Doll (Linking Smoking and Health Problems) Leonardo Da Vinci (Anatomy)			Nutritionist Link with school kitchen Nurse – no smoking Contact - smoking charities/mental health		
Comparative tests *Doing a test*	**identify and classify** *Finding names for things and putting them in groups*	**Observation over time** Looking and measuring more than once.	**Pattern Seeking** Finding patterns	**Research** Reading books and using the computer.	
How does the length of time we exercise for affect our heart rate? Can exercising regularly affect your lung capacity? Which type of exercise has the greatest effect on our heart rate? How does exercise effect our pulse 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?	How do our choices affect how our bodies work? 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? • How does size of muscle affect our pulse rate? • How might the circulatory system of an elephant, a hummingbird, or a polar bear differ?

St Johns Meads Church of England Primary School

Year 6
Scientists and Inventors
Term 2

Substantive knowledge	Sticky knowledge	Vocabulary	Linked texts
• Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • Taking measurements, using a range of scientific equipment with increasing accuracy and precision • Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graphs • Using test results to make predictions to set up further comparative and fair tests • Using simple models to describe scientific ideas • Reporting and presenting findings from enquiries, including conclusions, casual relationships and explanations of results, in oral and written forms such as displays and other presentations • Identifying scientific evidence that has been used to support or refute ideas or arguments	Describe their observations from an enquiry into black holes. Classify invertebrates using prompts Explain how cholesterol affects the body. Answer questions about the effects of penicillin using a scatter graph Explain the importance of the discoveries of Mary Leakey Explain the basic function of the heart. use recognised symbols to represent computer components	Astrophysicist, black holes, theories, universe, classification, zoologist, invertebrates, circulatory system, antibiotic, bacteria, penicillin, hominins, evolution, blood transfusions, anaesthetic, innovator, entrepreneur, technology, cholesterol.	

Prior learning	Future learning
• Asking relevant questions and using different types of scientific enquiries to answer them • Setting up simple practical enquiries, comparative and fair tests • Making systematic observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • Gathering, recording classifying and presenting data in a variety of ways to help in answering questions • Recording findings using simple scientific language, drawing. Labelled diagrams, keys, bar charts and tables • Reporting on finding from enquiries, including oral and written explanations, displays or presentations of results and conclusions • Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • Identifying differences, similarities or changes related to simple scientific ideas and processes • Using straightforward scientific evidence to answer questions or to support their findings	KS3 -

St Johns Meads Church of England Primary School

Key scientists and careers			Enhancement How we exceed the national curriculum		
Stephen Hawking (Astrophysics) Libbie Hyman (Zooloogist) Marie Maynard Daly (Circulatory System) Alexander Fleming (discovery of antibiotics) Mary Leaky (Discovery of hominin fossils) Dr Daniel Hale Williams (Doctor who performed first open heart surgery) Steve Jobs (Founder of Apple)			Guest visitors – doctor/pharmasist/zoo keeper Computer technician/expert		
Comparative tests *Doing a test*	**identify and classify** *Finding names for things and putting them in groups*	**Observation over time** Looking and measuring more than once.	**Pattern Seeking** Finding patterns	**Research** Reading books and using the computer.	
To recognise how diet effects the way the body functions.	Identify plants and animals based on specific characteristics. To label the parts and function of the heart. To design simple circuits.	To understand how Steve Jobs used electronics to design and develop computers.	To understand Stephen Hawkings theories about black holes. To interpret data on the effects of penicillin using a scatter graph.	To understand the life and works of Mary Leakey. To explain the achievements of Dr Daniel Hale Williams.	To discover how and why new inventions and discoveries impact our way of life?

St Johns Meads Church of England Primary School

Year 6
Light
Term 3

Substantive knowledge	Sticky knowledge	Vocabulary	Linked texts
• Recognise that light appears to travel in straight lines. • Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye. • Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. • 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, e.g. periscope, telescope, binoculars, mirror, magnifying glass etc.	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 (unless they are black). Non shiny surfaces scatter the light, so we do not see the beam. • Light travels in straight lines.	Light source, dark, reflect, ray, mirror, bounce, visible, beam, sun, glare, travel, straight, opaque, shadow, block, transparent, translucent. Reflect Absorb Emitted Scattered Refraction	Letters from the Lighthouse (Emma Carroll) The King Who Banned the Dark (Emily Haworth-Booth)

Prior learning	Future learning
In Year 3 children should: • 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	In Key Stage 3, children will learn about: • 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 mirrors, the pinhole camera, the refraction of light and action of convex lens in focusing (qualitative), 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 (qualitative only); differential colour effects in absorption and diffuse reflection.

St Johns Meads Church of England Primary School

Key scientists and careers			Enhancement How we exceed the national curriculum		
Thomas Young (Wave Theory of Light) Ibn al-Haytham (Light and our Eyes) Percy Shaw (The Cats Eye)					
Comparative tests *Doing a test*	**identify and classify** *Finding names for things and putting them in groups*	**Observation over time** Looking and measuring more than once.	**Pattern Seeking** Finding patterns	**Research** Reading books and using the computer.	
How does the angle that a light ray hits a plane mirror affect the angle at which it reflects off the surface? Which material is most reflective?	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?	Does the temperature of a light bulb go up the longer it is on? How does my shadow change over the day?	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	Why do some people need to wear glasses to see clearly? How do our eyes adapt to different conditions? (light/dark- pupil)	Why does my shadow change length over the course of a day?

St Johns Meads Church of England Primary School

Year 6
Evolution and Inheritance
Term 4

Substantive knowledge	Sticky knowledge	Vocabulary	Linked texts
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 adaptation 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	• Life cycles have evolved to help organisms survive to adulthood. • Over time the characteristics that are most suited to the environment become increasingly common. NB: The following could be duplicated in Year 6 Living things and their habitats. • 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 characteristic patterns. • Variation exists within a population (and between offspring of some plants) • Competition exists for resources and mates	Fossils, Adaptation, Evolution, Characteristics, Reproduction, Genetics, Variation, Inherited, Environmental, Mutation, Competition, Survival of the Fittest, Evidence,	One Smart Fish (Christopher Wormell) The Molliebird (Jules Pottle) Our Family Tree (Lisa Westberg Peters)

Prior learning	Future learning
From Key Stages 1 & 2, children should: • 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	In Key Stage 3 children will learn about: • heredity as the process by which genetic information is transmitted from one generation to the next • the variation between individuals 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 compete 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.

St Johns Meads Church of England Primary School

Key scientists and careers			Enhancement How we exceed the national curriculum		
Charles Darwin (theory of evolution) Alfred Russel Wallace (Theory of Evolution by Natural Selection)			Trip to the Science Museum		
Comparative tests *Doing a test*	**identify and classify** *Finding names for things and putting them in groups*	**Observation over time** Looking and measuring more than once.	**Pattern Seeking** Finding patterns	**Research** Reading books and using the computer.	
What is the most common eye colour in our class?	Compare the skeletons of apes, humans, and Neanderthals – how are they similar, and how are they different? Can you classify these observations into evidence for the idea of evolution, and evidence against?	How has the skeleton of the horse changed over time?	Is there a pattern between the size and shape of a bird's beak and the food it will eat?	What happened when Charles Darwin visited the Galapagos islands? What ideas did American geneticist Barbara McClintock have about genes that won her a Nobel Prize?	What is evolution, how does it happen and how do scientists know? • Why are we all different? • What is variation, and why is it important? • What evidence is there for evolution? • What reasons do animals become extinct? • How did Darwin come up with the theory?

St Johns Meads Church of England Primary School

Year 6
Living things and their habitats
Term 5

Substantive knowledge	Sticky knowledge	Vocabulary	Linked texts
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	• Variation exists within a population (and between offspring of some plants) – NB: this Key Idea is duplicated in Year 6 Evolution and Inheritance. • 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 characteristic patterns. • Competition exists for resources and mates	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, invertebrates, vertebrates, Linnaean.	Beetle Boy (M G Leonard) Insect Soup (Barry Louis Polisar) Fur and Feathers (Janet Halfmann)

Prior learning	Future learning
In Year 4, children should: • 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.	In Key Stage 3 children will learn about: • 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 atmosphere • the adaptations of leaves for photosynthesis. • the interdependence of organisms in an ecosystem, including food webs and insect pollinated crops • the importance of plant reproduction through insect pollination in human food security • how organisms affect, and are affected by, their environment, including the accumulation of toxic materials.
Key scientists and careers	**Enhancement**

St Johns Meads Church of England Primary School

			How we exceed the national curriculum		
Carl Linnaeus (classification)					
Comparative tests *Doing a test*	**identify and classify** *Finding names for things and putting them in groups*	**Observation over time** Looking and measuring more than once.	**Pattern Seeking** Finding patterns	**Research** Reading books and using the computer.	
How does the temperature affect how much gas is produced by yeast? Which is the most common invertebrate on our school playing field?	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? Are they always harmful?	Why do we need to classify living things? • How do we classify? • What are the difficulties with classification? (penguins, whales, platypus) • How do animals change over time? • Why does variation exist? • What happens if animals of different species breed? (hybrids) • 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?

St Johns Meads Church of England Primary School

Year 6
Electricity
Term 6

Substantive knowledge	Sticky knowledge	Vocabulary	Linked texts
• Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. • Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches • Use recognised symbols when representing a simple circuit in a diagram.	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.	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.	Goodnight Mister Tom (Michelle Magorian) Blackout (John Rocco) Hitler's Canary (Sandi Toksvig)

Prior learning	Future learning
In Year 4, children should: • 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.	In Key Stage Three children will learn: • Electric current, measured in amperes, in circuits, series and parallel circuits, currents add where branches meet and current as flow of charge • Potential difference measured in volts, battery and bulb ratings, resistance measured in ohms, as the ratio of potential difference (p.d.) to current • Differences in resistance between conducting and insulating components (quantitative). • Separation of positive or negative charges when objects are rubbed together: transfer of electrons, forces between charged objects • The idea of electric field, forces acting across the space between objects not in contact.

St Johns Meads Church of England Primary School

Key scientists and careers			Enhancement How we exceed the national curriculum		
Alessandro Volta (electrical battery) Nicola Tesla (Alternating Currents)			Electrician Bell Tout Lighthouse visit Eastbourne Lighthouse		
Comparative tests *Doing a test*	**identify and classify** *Finding names for things and putting them in groups*	**Observation over time** Looking and measuring more than once.	**Pattern Seeking** Finding patterns	**Research** Reading books and using the computer.	
How does the voltage of the batteries in a circuit affect the brightness of the lamp? How does the voltage of the batteries in a circuit affect the volume of the buzzer? Which make of battery lasts the longest? Which type of fruit makes the best fruity battery?	How would you group electrical components and appliances based on what electricity makes them do?	How does brightness of bulb change as the battery runs out? How can we measure how quickly a battery is used up?	Does the temperature of a light bulb go up the longer it is on?	How has our understanding of electricity changed over time?	What is electricity? • Do all batteries push as hard as each other? • How does the voltage of a batteries affect how much current is pushed? • How does the length of time I leave the current flowing for affect the brightness of the bulb? • Are all types of wires as good as conducting electricity? • Why are wires insulated in plastic? • What renewable ways can we generate electricity? • What are the dangers of a short circuit?

Useful resources to support planning lessons
https://explorify.uk/en/activities Explorify is an exciting programme of free activities for primary school teachers.
https://www.stem.org.uk STEM Is an acronym for science, technology, engineering and mathematics – offering support and resources for primary curriculum. These four fields share an emphasis on innovation, problem-solving, and critical thinking. And together they make up a popular and fast-growing industry. Most STEM workers use computers and other technology in their day-to-day jobs.
www.pstt.org.uk The Primary Science Teaching Trust helps improve the teaching and learning of science to children and young people in the UK. Discover more today.
https://www.planassessment.com/ Resources to support the planning and assessment of the Primary Nation Curriculum for Science