



St Joseph the Worker Catholic Primary School
Curriculum Overview and Progression
Subject: Science



Year R	
Disciplinary knowledge and skills	
Changing Seasons	<u>Knowledge</u> To know: Some trees change in the four seasons. Some signs of each season (leaves on the ground, cold weather, daffodils growing and sunny weather). Some animals hibernate or store food in winter. The weather changes throughout the year. And compare weather types (rain, sun, snow and wind). <u>Skills</u> Beginning to share ideas and suggestions about what to do when working practically. Beginning to make guesses about what might happen. Commenting on what they see and hear in the natural world. Using non-standard units to measure. Drawing and labelling pictures of plants and animals. Recognising that tables can be used to record information. With support, grouping objects, plants and animals.
Animal Adventures	<u>Knowledge</u> To know: The names of familiar animals (e.g. farm animals, pets and animals seen in storybooks.) The main body parts of common animals (number of legs, wings, fur and tail). Animals, including humans, use their senses to explore the world. Animals need food. Animals and plants move, grow and feed. The difference between things that are living and things that are non-living. Plants and animals live in a range of different places (land, sea, air). Some different places where animals live on the school site. <u>Science action-</u> To know Some different job roles. <u>Skills</u> With support, asking questions about the natural world. Commenting on what they see and hear in the natural world. Drawing and labelling pictures of plants and animals. With support, grouping objects, plants and animals.



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Learning Sequence						
	Autumn 1	Autumn 2	Spring	Spring 2	Summer	Summer 2
1				Animal Adventures Living and non-living To sort objects into living and non-living.		
2				Describing minibeasts To find and describe minibeasts.		
3				On the farm To sort and describe farm animals.		
4				Animal homes To sort animals based on where they live.		
5	Changing seasons- Autumn treasures To recognise changes outside in autumn. Teach this lesson at the end of Autumn 1.	Changing season- Whatever the weather To recognise different types of weather. Teach this lesson at the end of Autumn 2.	Changing seasons- Lessons 3 – 6: Coming soon	Zoo animals To compare my home with a zoo animal home.		
Vocabulary						
Changing seasons: autumn season spring summer weather winter				alive compare desert farm group grow home minibeast move non-living ocean polar sort woodland zoo		



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Year 1	
Disciplinary knowledge and skills	
Autumn1- Animals: Sensitive Bodies	Knowledge To know: The key parts of the human body (including head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth and teeth). The five main senses: sight, smell, hearing, taste and touch. The skin is used for touch, the tongue is used for taste, the nose is used for smell, the eyes are used for sight and the ears are used for hearing. <u>Science in action-</u> To know: A range of jobs and careers that use scientific knowledge and methods. About the work of modern-day scientists. There are spiritual, moral, social and cultural links with science. Skills <u>Posing questions-</u> Recognising there are different types of enquiry (ways to answer a question). <u>Observing (qualitative data)-</u> Using their senses to describe, in simple terms, what they notice or what has changed. <u>Measuring (quantitative data)-</u> Using non-standard units to measure and compare. <u>Recording (diagrams)-</u> Drawing and labelling simple diagrams. <u>Recording (tables)-</u> Using a prepared table to record results including numbers and simple observations. <u>Grouping and classifying-</u> Grouping based on visible characteristics. <u>Analysing and drawing conclusions-</u> Using their results to answer simple questions.
Autumn 2- Materials: Everyday Materials	Knowledge To know: Objects are items or things. A material is what an object is made from. A variety of everyday materials, including wood, plastic, glass, metal, water and rock. Property refers to how a material can be described. Materials can be grouped based on their physical properties. Skills <u>Posing questions-</u> Responding to suggestions on how to answer questions. <u>Planning-</u> Beginning to recognise whether a planned test is fair. With support, deciding if suggested observations are suitable. <u>Predicting-</u> Suggesting what might happen, often justifying with personal experience. <u>Observing (qualitative data)-</u> Using their senses to describe, in simple terms, what they notice or what has changed. <u>Recording (tables)-</u> Using a prepared table to record results including simple observations. <u>Grouping and classifying-</u> Grouping based on visible characteristics. <u>Analysing and drawing conclusions-</u> Using their results to answer simple questions. Beginning to recognise when results or observations do not match their predictions.
Spring 1- Forces and	Knowledge To know:



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space: Seasonal Changes	The name and order of the four seasons: spring, summer, autumn and winter. That it is unsafe to look directly at the Sun. The weather associated with the four seasons and how it changes (in the UK). That day length varies across the four seasons, with fewer daylight hours in the winter and more in the summer. <u>Science in action-</u> To know: About a range of jobs and careers that use scientific knowledge and methods, e.g. weather reporter. <u>Skills</u> <u>Posing questions-</u> Exploring the world around them and raising their own simple questions. <u>Predicting-</u> Suggesting what might happen, often justifying with personal experience. <u>Observing (qualitative data)-</u> Using their senses to describe, in simple terms, what they notice or what has changed. <u>Researching-</u> Gathering specific information from one simplified, specified source. <u>Recording (tables)-</u> Using a prepared table to record tally frequency. <u>Graphing-</u> Representing data using pictograms. <u>Analysing and drawing conclusions-</u> Using their results to answer simple questions.
Spring 2- Plants: Introduction to Plants	<u>Knowledge</u> To know: A variety of common plants and how they differ. That deciduous trees lose their leaves seasonally but evergreen trees do not. The basic structure, including leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches and stem, of a variety of common plants, including flowering plants and trees. To begin to understand how plants grow and change over time. <u>Science in action-</u> To know: About famous scientists throughout history. About the work of modern-day scientists. There are spiritual, moral, social and cultural links with Science. <u>Skills</u> <u>Posing questions-</u> Exploring the world around them and raising their own simple questions. Recognising there are different types of enquiry (ways to answer a question). Responding to suggestions on how to answer questions. <u>Planning-</u> With support, deciding if suggested observations are suitable. Ordering a simple method. <u>Predicting-</u> Suggesting what might happen, often justifying with personal experience. <u>Observing (qualitative data)-</u> Using their senses to describe, in simple terms, what they notice or what has changed. <u>Measuring (quantitative data)-</u> Using non-standard units to measure and compare. <u>Researching-</u> Gathering specific information from one simplified, specified source. <u>Recording (diagrams)-</u> Drawing and labelling simple diagrams. <u>Recording (tables)-</u> Using a prepared table to record results including: numbers; simple observations. <u>Grouping and classifying-</u> Grouping based on visible characteristics. <u>Analysing and drawing conclusions-</u> Using their results to answer simple questions. Beginning to recognise when results or observations do not match their predictions.



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Summer 1- Animals: Comparing animals	<u>Knowledge</u> To know: A variety of common animals (including fish, amphibians, reptiles, birds and mammals). The main body parts of common animals (arms, legs, wings, tails, fins, head, trunk, horns, tusks and shell). A carnivore is an animal that eats other animals and to give some examples. A herbivore is an animal that eats only plants and to give some examples. An omnivore is an animal that eats both animals and plants and to give some examples. <u>Science in action-</u> To know: About famous scientists throughout history. <u>Skills</u> <u>Posing questions-</u> Recognising there are different types of enquiry (ways to answer a question). Responding to suggestions on how to answer questions. <u>Planning-</u> With support, deciding if suggested observations are suitable. <u>Observing (qualitative data)-</u> Using their senses to describe, in simple terms, what they notice or what has changed. <u>Researching-</u> Gathering specific information from one simplified, specified source. <u>Recording (diagrams)-</u> Drawing and labelling simple diagrams. <u>Grouping and classifying-</u> Grouping based on visible characteristics. <u>Graphing-</u> Representing data using pictograms and block charts. <u>Analysing and drawing conclusions-</u> Using their results to answer simple questions.
Summer 2- Making Connections: Investigating Science through stories	<u>Knowledge</u> <u>Plants-</u> To know: The basic structure, including leaves, flowers (blossom), fruit, roots, bulb, seed, trunk, branches and stem, of a variety of common plants, including flowering plants and trees. How plants grow and change over time. <u>Animals, including humans-</u> To know: A variety of common animals (including fish, amphibians, reptiles, birds and mammals). The main body parts of common animals (arms, legs, wings, tails, fins, head, trunk, horns/tusks and shell). The diets of carnivores, herbivores and omnivores and give examples. <u>Everyday materials-</u> To know: A variety of everyday materials, including wood, plastic, glass, metal, water and rock. Property refers to how a material can be described. The physical properties of a variety of everyday materials. <u>Seasonal changes-</u> To know: The name and order of the four seasons: spring, summer, autumn and winter. The weather associated with the four seasons and how it changes (in the UK). <u>Science in action-</u> To know about a range of jobs and careers that use scientific knowledge and methods. <u>Skills</u> <u>Posing questions-</u> Exploring the world around them and raising their own simple questions. Recognising there are different types of enquiry (ways to answer a question). Responding to suggestions on how to answer questions. <u>Planning-</u> Beginning to recognise whether a planned test is fair. With support, deciding if suggested observations are suitable. <u>Predicting-</u> Suggesting what might happen, often justifying with personal experience. <u>Observing (qualitative data)-</u> Using their senses to describe, in simple terms, what they notice or what has changed.



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	<u>Measuring (quantitative data)</u> - Beginning to use standard units and read simple scales to measure and compare. Beginning to use simple measuring equipment to make approximate measurements. <u>Researching</u> - Gathering specific information from one simplified, specified source. <u>Recording (tables)</u> - Using a prepared table to record results including: numbers; simple observations. <u>Grouping and classifying</u> - Grouping based on visible characteristics. <u>Analysing and drawing conclusions</u> - Using their results to answer simple questions. Beginning to recognise when results or observations do not match their predictions					
Learning Foci						
	Autumn1- Animals: Sensitive Bodies	Autumn 2- Materials: Everyday Materials	Spring 1- Forces and space: Seasonal Changes	Spring 2- Plants: Introduction to Plants	Summer 1- Animals: Comparing animals	Summer 2- Making Connections: Investigating Science through Stories
LF1	Body parts Knowledge- To name parts of the human body. Working scientifically- To sort body parts into groups.	Naming materials Knowledge- To identify everyday materials. Working scientifically- To sort objects into groups based on the materials they are made from.	Wonderful weather Knowledge- To identify how the weather changes across the four seasons.	What is a plant? Knowledge- To identify plants in the school grounds. Working scientifically- To plan an investigation.	Animal groups To identify and group animals.	Do taller trees have wider trunks? Knowledge- To observe changes across the seasons. Working scientifically- To spot patterns in data.
LF2	The senses Knowledge- To name the body parts used for each sense. Working scientifically- To spot patterns in data.	Materials detectives Knowledge- To recognise the difference between objects and materials.	Seasonal activities Knowledge- To identify events and activities that take place in different seasons.	Parts of a plant Knowledge- To identify parts of a flowering plant. Working scientifically- To draw and label a diagram.	Describing animals To describe a variety of animals.	Comparing woodland animals Knowledge- To describe and compare the features of animals. Working scientifically- To carry out research to find specific information.
LF3	Taste and touch Knowledge- To identify the body parts used for the sense of taste and touch. Working scientifically- To use the senses to make observations.	Introduction to properties Knowledge- To describe the properties of materials.	How do trees change? Knowledge- To recognise how trees change across the four seasons.	Wild and garden plants Knowledge- To identify and name wild and garden plants. Working scientifically- To sort flowers into groups.	Comparing animals To compare the features of animals.	Measuring animal footprints Knowledge- To identify differences in animal features. Working scientifically- To use a ruler to measure.
LF4	Sight and smell Knowledge- To identify the body parts used for the sense of smell and sight. Science in action- To recognise that scientists are always making new discoveries.	Is it absorbent? Knowledge- To group materials based on their properties (absorbency). Working scientifically- To make observations and record data.	Daylight hours Knowledge- To recognise that daylight hours change across the four seasons. Working scientifically- To record data in a pictogram.	Deciduous and evergreen trees Knowledge- To identify and name deciduous and evergreen trees. Working scientifically- To measure and compare leaves.	Carnivore, herbivore or omnivore? Knowledge- To identify animals that are carnivores, herbivores and omnivores. Working scientifically- To research using non-fiction texts.	Building an animal home Knowledge- To describe the properties of everyday materials. Working scientifically- To plan how to carry out a test.



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LF5	Hearing Knowledge- To identify the body part used for the sense of hearing. WORKING SCIENTIFICALLY-To investigate how sound changes as you move further away.	Is it waterproof? Knowledge- To group materials based on their properties (waterproofness). Working scientifically- To plan a test and suggest what might happen.	Observing over time Knowledge- To observe changes across the four seasons. Working scientifically- To gather and record data about how seasons change over time.	Sorting seeds Knowledge- To recognise that new plants come from seeds and bulbs. Working scientifically- To recognise that observations do not always match predictions.	Pets Knowledge- To recognise animals that make suitable pets. Working scientifically- To gather and record data to help in answering questions.	Are birds carnivores, herbivores or omnivores? To identify animals that are carnivores, herbivores and omnivores.
LF6	Senses in action Knowledge- To recognise how the senses are used in everyday life. Science in action- To recognise the importance of the senses in certain jobs.	Is it tough? Knowledge- To group materials based on their properties (toughness). Working scientifically- To answer questions based on results.	Weather reports Knowledge- To plan and carry out a weather report.	Which plant parts can you eat? Science in Action- To recognise the importance of a scientist's role. Working scientifically- To use observations to find answers to questions.	Jane Goodall Knowledge- To describe and compare the structure of animals. Science in action- To know about famous scientists throughout history.	
Vocabulary						
compare group hearing pattern sense(s) sight smell taste touch	absorbent fabric glass group material metal object plastic rock tough waterproof wood	deciduous tree evergreen tree season weather	bulb deciduous diagram evergreen flower fruit garden plants group growth leaf measure observe roots seed stem trunk wild plants	amphibian bird carnivore compare diet difference fish group herbivore mammal observe omnivore reptile scientist similarity	amphibian bird carnivore compare data diet difference fish group herbivore mammal material object omnivore pattern reptile season similarity trunk waterproof weather	



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Year 2	
Disciplinary knowledge and skills	
Autumn 1- Living things: Habitats	<u>Knowledge</u> To begin to understand some of the life processes, including movement, reproduction, sensitivity, growth, excretion and nutrition. To know the difference between things that are living, dead, and things that have never been alive, using some of the life processes. To know a variety of plants and animals and describe some differences. To name a variety of habitats, including woodland, ocean, rainforest and coastal. To know that a habitat is the environment where an animal or plant lives/grows because it provides what they need to survive. To know that living things depend upon each other (e.g. for food, shelter.) To understand that a food chain can be used to show how animals obtain food from eating either plants and/or other animals. <u>Skills</u> <u>Posing questions</u>- Exploring the world around them and raising their own simple questions. Recognising there are different types of enquiry (ways to answer a question). <u>Researching</u>- Gathering specific information from one simplified, specified source. <u>Recording (tables)</u>- Using a prepared table to record results including simple observations. <u>Grouping and classifying</u>- Grouping based on visible characteristics.
Autumn 2- Living things: Microhabitats	<u>Knowledge</u> To know: A variety of plants and animals and describe some differences. That a habitat is the environment where an animal or plant lives/grows, because it provides what they need to survive. That a microhabitat is a very small habitat (e.g. under stones, logs and leaf litter). That living things depend upon each other (e.g. for food, shelter). <u>Skills</u> <u>Posing questions</u>- Exploring the world around them and raising their own simple questions. Recognising that there are different types of enquiry (ways to answer a question). <u>Responding to suggestions on how to answer questions.</u> <u>Planning</u>- With support, deciding if suggested observations are suitable. Ordering a simple method. <u>Predicting</u>- Suggesting what might happen, often justifying with personal experience. <u>Observing (qualitative data)</u>- Using their senses to describe, in simple terms, what they notice or what has changed <u>Researching</u>- Gathering specific information from one simplified, specified source. <u>Recording (tables)</u>- Recording results using simple observations and tally frequency. <u>Classification keys</u>- Organising questions to create a simple classification key. <u>Analysing and drawing conclusions</u>- Using results to answer simple questions. Beginning to recognise when results or observations do not match their predictions.
Spring 1- Materials: Uses of Everyday Materials	<u>Knowledge</u> To know: Objects are made from materials that suit their uses. One material can be used for a range of purposes. Different materials can be used for the same purpose. A push or pull must be applied to change the shape of a solid object.



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	Solid objects can be stretched, twisted, bent or stretched. Different solid objects may take different amounts of force to change shape. Science in action- To know: A range of jobs and careers that use scientific knowledge and methods. Science in the news and recent discoveries. Spiritual, moral, social and cultural links with Science. <u>Skills</u> <u>Posing questions</u>- Recognising there are different types of enquiry (ways to answer a question). <u>Measuring (quantitative)</u>- Using non-standard units to measure and compare. <u>Recording (tables)</u>- Using a prepared table to record results including numbers. <u>Grouping and classifying</u>- Grouping based on visible characteristics. <u>Graphing</u>- Representing data using pictograms and block graphs. <u>Analysing and drawing conclusions</u>- Using their results to answer simple questions.
Spring 2- Animals: Lifecycles and health	<u>Knowledge</u> To know: That baby, toddler, child, teenager and adult are human life cycle stages. There are differences in the life cycles of different animals. Humans grow as they age. <u>Skills</u> <u>Posing questions</u>- Recognising there are different types of enquiry (ways to answer a question). <u>Measuring (quantitative data)</u>- Beginning to use standard units and read simple scales to measure and compare. Beginning to use simple measuring equipment to make approximate measurements. <u>Researching</u>- Gathering specific information from one simplified, specified source. <u>Recording (tables)</u>- Using a prepared table to record results including numbers. <u>Analysing and drawing conclusions</u>- Using their results to answer simple questions.
Summer- Plants: Plant Growth	<u>Knowledge</u> To know: Seeds and bulbs grow into seedlings by producing roots and shoots. Seedlings grow into mature plants by developing parts such as roots, stems, leaves and flowers. Seeds need water and warmth to germinate. Plants need water, light and a suitable temperature for growth and health. Science in action- To know: A range of jobs and careers that use scientific knowledge and methods. There are spiritual, moral, social and cultural links with Science. <u>Skills</u> <u>Posing questions</u>- Exploring the world around them and raising their own simple questions. Recognising there are different types of enquiry (ways to answer a question). Responding to suggestions on how to answer questions. <u>Planning</u>- Beginning to recognise whether a planned test is fair. With support, deciding if suggested observations are suitable. <u>Predicting</u>- Suggesting what might happen, often justifying it with personal experience.



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	<u>Observing</u>- Using their senses to describe, in simple terms, what they notice or what has changed. <u>Measuring (quantitative data)</u>- Beginning to use standard units and read simple scales to measure and compare. Beginning to use simple measuring equipment to make approximate measurements. <u>Recording (diagrams)</u>- Drawing and labelling simple diagrams. <u>Recording (tables)</u>- Using a prepared table to record results including: numbers; simple observations. <u>Analysing and drawing conclusions</u>- Using their results to answer simple questions. Beginning to recognise when results or observations do not match their predictions.					
Summer 2- Making connections: Plant Based Materials	Knowledge <u>Plants</u>- To know: Seeds and bulbs grow into seedlings by producing roots and shoots. Seeds need water and warmth to germinate. Plants need water, light and a suitable temperature for growth and health. <u>Living things and their habitats</u>- To know: Some of the life processes, including movement, reproduction, sensitivity, growth, excretion and nutrition. The difference between things that are living, dead and things that have never been alive, using some of the life processes. <u>Materials</u>- To know: Why objects are made from particular materials and to give examples of their suitability. One material can be used for a range of purposes (and to give examples.) Different materials can be used for the same purpose (and to give examples.) Why certain materials are unsuitable for particular objects. Solid objects can be squashed, bent, twisted or stretched. <u>Science in action</u>- To know: About famous scientists throughout history. About the work of modern-day scientists. Skills <u>Posing questions</u>- Exploring the world around them and raising their own simple questions. Recognising there are different types of enquiry (ways to answer a question). Responding to suggestions on how to answer questions. <u>Planning</u>- Beginning to recognise whether a planned test is fair. With support, deciding if suggested observations are suitable. <u>Predicting</u>- Suggesting what might happen, often justifying it with personal experience. <u>Observing (qualitative data)</u>- Using their senses to describe, in simple terms, what they notice or what has changed. <u>Researching</u>- Gathering specific information from one simplified, specified source. <u>Recording (tables)</u>- Using a prepared table to record results including: numbers; simple observations. <u>Grouping and classifying</u>- Grouping based on visible characteristics. <u>Analysing and drawing conclusions</u>- Using their results to answer simple questions. Beginning to recognise when results or observations do not match their predictions.					
Learning Foci						
	Autumn 1- Living things: Habitats	Autumn 2- Living things: Microhabitats	Spring 1- Materials: Uses of Everyday Materials	Spring 2- Animals: Lifecycles and health	Summer- Plants: Plant Growth	Summer 2- Making connections: Plant Based Materials
LF1	Life processes To identify some of the characteristics of living things.	Identifying and classifying minibeasts Working scientifically-To classify a variety of minibeasts.	Objects and materials To recognise that objects are made from materials that suit their uses. Working scientifically-To recognise that objects can be grouped.	The human life cycle To identify different stages of the human life cycle.	What do seeds need to grow? Knowledge- To recognise that seeds need certain conditions for growth. Working scientifically-To plan comparative tests.	Reduce, reuse, recycle Knowledge- To describe how materials can be reused. Science in action- To understand how the 3Rs contribute to sustainable products.



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LF2	It feels good to be alive To recognise the difference between things that are alive, were once alive or have never been alive. Working scientifically-To classify objects into groups.	Introduction to scientific enquiry Working scientifically- To recognise how scientists answer questions.	Which material is suitable? To recognise that objects are made from materials that suit their uses.	Life cycles To know which offspring come from which parent animal.	Seeds and bulbs Knowledge- To recognise that seeds and bulbs contain what they need to grow into a plant. Working scientifically- To measure with a ruler.	From plants to products Knowledge- To identify human-made and natural materials. Working scientifically- To group based on characteristics.
LF3	Introduction to habitats To identify plants and animals in different habitats.	Minibeast hunt To recognise that living things live in habitats to which they are suited. Working scientifically-To gather and record data to answer a question.	Stretch it, twist it, bend it, squash it! Knowledge- To recognise that the shape of some solid objects can be changed. Working scientifically-To record data in a table.	Growth To observe and measure growth in humans. Working scientifically-To use simple measuring equipment.	Germination Knowledge- To describe what seeds need to germinate. Working scientifically- To record data in a table.	Testing suitability Knowledge- To identify suitable materials based on their properties. Working scientifically- To perform a test and gather data.
LF4	Woodland habitats To identify how a habitat provides animals and plants with what they need to survive. WS: To carry out research to find answers to questions.	Planning an experiment Working scientifically-To ask questions and plan how to carry out an experiment.	Testing stretchiness Knowledge- To compare the suitability of materials for particular uses. Working scientifically-To gather data and use it to answer a question.	Survival To identify and list the basic needs for survival for humans and animals. Working scientifically- To use secondary sources to research.	Light and plant growth Knowledge- To describe the effect of light on plant growth. Working scientifically-To observe using a magnifying glass.	Testing plant pots Knowledge- To identify a material to help plant growth. Working scientifically- To use observations to answer a simple question.
LF5	Rainforest and ocean habitats To recognise how animals and plants depend on each other.	Woodlice experiment Working scientifically-To carry out an experiment and record data in a table.	Testing strength To recognise that the strength of some materials can be changed. Working scientifically-To record data in a block graph.	Exercise and hygiene To recognise the importance of exercise and personal hygiene. Working scientifically-To make observations over time.	Plant life cycle Knowledge- To identify stages of a plant's life cycle. Working scientifically-To draw and label diagrams.	Choosing materials Knowledge- To choose materials to create a suitable plant pot. Working scientifically- To identify and classify living things.
LF6	Food chains To recall how animals get their food from plants and other animals.	What is a botanist? To identify a variety of flowering plants. Science in action: To understand the role of a botanist.	Eco-friendly materials Knowledge- To compare the suitability of materials for particular uses. Science in action	Balanced diet To identify how to have a balanced diet. Working scientifically-To interpret collected results.	Plant care Knowledge- To recognise what plants need for healthy growth. Science in action To recognise that humans have a responsibility to care for plants.	



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			To recognise that some materials are harmful to the environment.			
Vocabulary						
alive carnivore (Y1) dead depend diet (Y1) energy food chain growth (Y1) habitat herbivore (Y1) life processes mammal (Y1) omnivore (Y1) predator prey shelter sort (Y1)	food chain microhabitat minibeast research results test	elastic fabric (Y1) flexible glass (Y1) material (Y1) metal (Y1) object (Y1) plastic (Y1) property rock (Y1) suitable wood (Y1)	basic needs egg health hygiene life cycle live young pupa spawn survive teenager toddler tadpole	bulb (Y1) diagram (Y1) energy flower (Y1) germinate growth (Y1) leaf (Y1) life cycle nutrient observe (Y1) seed (Y1) shoot stem (Y1)	alive dead fabric (Y1) flexible germinate growth (Y1) invention life processes material (Y1) plastic (Y1) property results seed (Y1) suitable test waterproof (Y1) wood (Y1)	



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Year 3	
Disciplinary knowledge and skills	
Autumn 1- Animals: Movement and nutrition	<u>Knowledge</u> To know: Animals can be grouped based on the presence of a skeleton. The skeleton in humans and some animals is used for movement, protection and support. The muscular system in humans and some animals works with the skeleton for movement. The main bones in the body. Animals, including humans, need the right types and amount of nutrition. Humans cannot make their own food; therefore, they eat to get the nutrition needed. There are nutrient groups (carbohydrates, protein, fats, fibre, vitamins, minerals and water) with their own functions in the body. A balanced diet should include all nutrient groups. Animals have different diets. <u>Science in action</u>- To know: There are famous scientists throughout history. There are a range of jobs and careers that use scientific knowledge and methods. Scientific work is taking place with modern-day scientists. There are science events in the news and recent discoveries. There are methods and equipment used by scientists throughout history that have led to modern methods. Scientific knowledge has changed over time, leading to the current understanding of Science. There is current scientific research taking place with aims for the future. <u>Skills</u> <u>Measuring</u>- Using standard units to measure and compare. Using measuring equipment with increasing accuracy. Reading scales with unmarked intervals between numbers. <u>Researching</u>- Gathering specific information from a variety of sources. <u>Recording</u>- Using a prepared table to record results including more detailed observations. <u>Grouping and classifying</u>- Grouping based on visible characteristics and measurable properties. <u>Analysing</u>- Writing a conclusion to summarise findings using simple scientific vocabulary. <u>Evaluating</u>- Beginning to identify new questions that would further the enquiry.
Autumn 2- Forces and space: Forces and magnets	<u>Knowledge</u> To know: Examples of contact and non-contact forces. Some forces are a result of contact between two surfaces but some forces can act at a distance (e.g. magnetism). Magnets have a north and south pole. Some examples of magnetic materials, including iron and nickel, and how they react to a magnet and each other. Some different examples of magnets, including bar, horseshoe, button and ring.



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	Some uses of magnets. Friction is a contact force that acts between two surfaces to slow an object down. Magnetism is a non-contact force that affects objects containing magnetic metal. The opposite poles of a magnet attract one another and like poles repel one another. Rougher surfaces have more friction between them than smoother surfaces. The strength of different magnets may vary. <u>Skills</u> <u>Planning</u>- Beginning to select from options which variables will be changed, measured and controlled. Suggesting what observations to make and how long to make them for. Planning a simple method, verbally and in writing. <u>Researching</u>- Gathering specific information from a variety of sources. <u>Recording</u>- Beginning to draw more scientific diagrams by labelling with more scientific vocabulary and using arrows. Representing data using bar charts. <u>Analysing</u>- Writing a conclusion to summarise findings using simple scientific vocabulary. Beginning to suggest how one variable may have affected another. Beginning to quote results as evidence of relationships. <u>Science in action</u>- Exploring the uses of friction and magnets in everyday life and industry.
Spring 1- Materials: Rocks and soils	<u>Knowledge</u> To know: That rocks can be grouped based on their appearance or properties (e.g. colour, texture, hardness and permeability). That rocks may contain grains, crystals or fossils. That grains and crystals appear differently and can be used to classify rocks. That soils are made from rocks and dead matter. The relationship between the properties of rocks and their uses. That fossils can form from the remains of living things. That rocks can change over time (e.g. erosion and weathering). <u>Skills</u> <u>Observing</u>- Using their senses to describe, in more detail and with simple scientific vocabulary, what they notice or what has changed. <u>Researching</u>- Gathering specific information from a source. <u>Recording</u>- Beginning to draw more scientific diagrams by: Drawing in 2D to produce simple line diagrams. Labelling with more scientific vocabulary. <u>Grouping and classifying</u>- Grouping based on visible characteristics and measurable properties. <u>Graphing</u>- Representing data using bar charts. <u>Analysing and drawing conclusions</u>- Beginning to suggest how one variable may have affected another. Beginning to quote results as evidence of relationships. Beginning to use identified patterns to predict new values or trends.



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Spring 2- Energy: Light and shadow	Knowledge To know: Light travels from a source (e.g. the Sun, light bulbs and torches). Light is needed to see things and that dark is the absence of light. Light from the Sun can be dangerous and how to protect their eyes. All materials reflect light. Shadows form when the light from a light source is blocked by an opaque object. Shadows change as a result of changing the position of the light source and changing the distances between the light source, object and surface. Shadows change position and length throughout the day as the Sun changes position in the sky. <u>Science in action-</u> To know: Famous scientists throughout history. A range of jobs and careers use scientific knowledge and methods. There are spiritual, moral, social and cultural links with Science. Methods and equipment used by scientists throughout history and how these have led to modern methods. Scientific knowledge has changed over time, leading to the current understanding of Science. Collaboration and peer reviewing are essential for effective scientific progress. <u>Skills</u> <u>Posing questions-</u> Beginning to raise further questions during the enquiry process. Considering what makes a testable question. Beginning to recognise that there are different types of enquiry and that they are suitable for different questions. Beginning to make suggestions about how different questions could be answered. <u>Planning-</u> Making predictions about what they think will happen by using scientific knowledge and/or personal experience to explain their prediction. <u>Observing-</u> Using their senses to describe, in more detail and with simple scientific vocabulary, what they notice or what has changed. <u>Measuring-</u> Using standard units to measure and compare. Using measuring equipment with increasing accuracy. Reading scales with unmarked intervals between numbers. <u>Recording-</u> Using a prepared table to record results including more detailed observations. Using tables with more than two columns. Identifying and adding headings to tables. Beginning to design simple results tables. <u>Grouping and classifying-</u> Grouping based on visible characteristics and measurable properties. <u>Graphing-</u> Reading the value of bars with greater accuracy. <u>Analysing and drawing conclusions-</u> Writing a conclusion to summarise findings using simple scientific vocabulary. Beginning to suggest how one variable may have affected another. Beginning to quote results as evidence of relationships. Identifying data that does not fit a pattern (anomalous data). Recognising when results or observations do not match their predictions. Beginning to use identified patterns to predict new values or trends. <u>Evaluating-</u> Beginning to identify steps in the method that need changing and suggest improvements. Beginning to identify which variables were difficult to control and suggesting how to better control them. Beginning to identify new questions that would further the enquiry.
Summer 1- Plants: Plant reproduction	<u>Knowledge</u> To know: The functions of the basic parts of a plant and the relationship between structure and function.



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	Water is transported within a plant from the root, through the stem, to the leaves. Plants need water, light, air, nutrients and a suitable temperature for growth and health. The needs for growth and health vary from plant to plant. The life cycle of a plant from seed to mature plant. Flowers are the reproductive organs of a plant. Pollination is the transfer of pollen to the female (part of the) flower. The process of seed formation is the growth of a seed after pollination. Different methods of seed dispersal and the benefits of each. <u>Skills</u> <u>Posing questions</u>- Beginning to raise further questions during the enquiry process. Considering what makes a testable question. Beginning to recognise that there are different types of enquiry and that they are suitable for different questions. Beginning to make suggestions about how different questions could be answered. <u>Planning</u>- Beginning to suggest what observations to make and how long to make them for. Making predictions about what they think will happen by using scientific knowledge and/or personal experience to explain their prediction. <u>Observing</u>- Using their senses to describe, in more detail and with simple scientific vocabulary, what they notice or what has changed. <u>Measuring</u>- Using standard units to measure and compare. Using measuring equipment with increasing accuracy. Reading scales with unmarked intervals between numbers. <u>Recording</u>- Using a prepared table to record results including more detailed observations. Using tables with more than two columns. Identifying and adding headings to tables. Beginning to design simple results tables. <u>Grouping and classifying</u>- Grouping based on visible characteristics and measurable properties. <u>Graphing</u>- Reading the value of bars with greater accuracy. <u>Analysing and drawing conclusions</u>- Writing a conclusion to summarise findings using simple scientific vocabulary. Beginning to suggest how one variable may have affected another. Beginning to quote results as evidence of relationships. Identifying data that does not fit a pattern (anomalous data). Recognising when results or observations do not match their predictions. Beginning to use identified patterns to predict new values or trends. <u>Evaluating</u>- Beginning to identify steps in the method that need changing and suggest improvements. Beginning to identify which variables were difficult to control and suggesting how to better control them.
Summer 2- Making connections: Does hand span affect grip strength?	<u>Knowledge</u> This unit revises the following key knowledge from the previous Year 3 units: <u>Movement and nutrition</u>- To know: The muscular system in humans and some animals works with the skeleton for movement. The main food groups (carbohydrates, protein, fats and oils, fibre, vitamins, minerals and water) and their simple functions. <u>Forces and magnets</u>- To know: Friction is a contact force that acts between two surfaces to slow an object down. Rougher surfaces have more friction between them than smoother surfaces. <u>Rocks and soil</u>- To understand the relationship between the properties of rocks and their uses. <u>Light and shadows</u>- To know that shadows are formed when the light from a light source is blocked by an opaque object. <u>Plant reproduction</u>- To know:



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Flowers are the reproductive organs of a plant. The process of pollination is the transfer of pollen to the female (part of the) flower. The process of seed formation is the growth of a seed after pollination.

Skills

This unit revisits the working scientifically skills covered in Year 3, including:
 Posing questions. Planning. Predicting. Observing. Measuring. Recording. Graphing. Analysing and drawing conclusions. Evaluating.

Learning Foci

	Autumn 1- Animals: Movement and nutrition	Autumn 2- Forces and space: Forces and magnets	Spring 1- Materials: Rocks and soils	Spring 2- Energy: Light and shadow	Summer 1- Plants: Plant reproduction	Summer 2- Making connections: Does hand span affect grip strength?
LF1	Skeletons Knowledge- To explain the role of a skeleton. Working scientifically- To group animals based on their physical properties.	Pushes, pulls and twists Knowledge- To describe the effects of contact forces. Working scientifically- To label a diagram using arrows and scientific vocabulary.	Rocks: Appearance Knowledge- To group rocks using their appearance. Working scientifically- To observe the appearance of rocks closely, using a magnifying glass.	Sources of light Knowledge- To explain the role of light sources. Working scientifically- To plan and draw a results table.	Plant growth Knowledge- To identify the growth and survival needs of plants. Working scientifically- To pose relevant questions.	Investigating grip strength – Planning Knowledge- To revise the units Movement and nutrition and Rocks and soil. Working scientifically- To plan a pattern seeking enquiry.
LF2	The bones in our body Knowledge- To recognise the main bones in the body. Working scientifically- To measure and sort data.	Friction Knowledge- To recognise the effects and uses of forces. Working scientifically- To write a scientific conclusion identifying cause and effect.	Rocks: Physical properties Knowledge- To group rocks using their physical properties. Working scientifically- To make predictions, suggest improvements and explain observations over time.	What is reflection? Knowledge- To compare light reflecting on different surfaces.	Structure and function Knowledge- To describe the relationship between structure and function in plants. Working scientifically- To design simple results tables.	Investigating grip strength – Gathering data Knowledge- To revise the units Movement and nutrition and Plant reproduction. Working scientifically- To gather and record data.
LF3	Muscles and movement Knowledge- To explain how muscles are used for movement. Science in action- To explore scientific advances.	Investigating friction Knowledge- To interpret how and why things move differently on different surfaces. Working scientifically- To plan an investigation using variables.	Fossil formation Knowledge- To describe the process of fossil formation. Working scientifically- To present research on fossil formation.	Where do shadows come from? Knowledge- To recognise which materials cast a shadow. Working scientifically- To ask testable questions and plan how to answer them.	Transporting water Knowledge- To investigate how water is transported in plants. Working scientifically- To plan a simple enquiry.	Investigating grip strength – Analysing, concluding and evaluating Knowledge- To revise the unit Forces and magnets. Working scientifically- To conclude and evaluate the investigation.



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LF4	Eating for survival Knowledge- To explain how food is an essential energy source for animals. Working scientifically- To gather and compare data to answer questions.	Magnets Knowledge- To describe the effects of magnets. Working scientifically- To write a method.	Fossils and palaeontology Knowledge- To identify fossils and group rocks accordingly. Working scientifically- To use the fossil record to answer questions about the past.	Shadows throughout the day Knowledge- To summarise how shadows change throughout the day. Working scientifically- To evaluate a method.	Flowers Knowledge- To explore the role of flowers in the life cycle of a plant. Working scientifically- To complete, read and interpret data in a bar chart.	Investigating grip strength – Extending Knowledge- To revise the unit Uses of materials. Working scientifically- To use sets of data to inform design.
LF5	Nutrient groups Knowledge- To identify the main nutrient groups and their simple functions. Working scientifically- To record information using secondary sources.	Investigating magnet strength Knowledge- To compare the properties of different types of magnets. Working scientifically- To display data using a bar chart.	Soil formation Knowledge- To compare soils and how they were formed. Working scientifically- To record the drainage rate for different soils in a bar chart.	Investigating shadows Knowledge- To investigate how the distance of the light source affects the size of its shadow. Working scientifically- To find patterns in data and form conclusions.	Evaluating an enquiry Knowledge- To apply knowledge of plant life and growth. Working scientifically- To identify and suggest changes to an enquiry.	Investigating grip strength – Presenting Knowledge- To revise the units Light and shadows and Movement and nutrition. Working scientifically- To report on my findings using a shadow puppet display.
LF6	Balanced diets Knowledge- To explain what makes a balanced diet. Science in action- To explore how knowledge has progressed over time and how different jobs use this information.	Uses of magnets Knowledge- To explain the uses of magnets. Working scientifically- To research the uses of magnets.	Soil layers and earthworms Knowledge- To describe a soil sample using sedimentation. Working scientifically- To draw and label a diagram.	Using light and shadows Knowledge- To tell a story using shadow puppets. Science in action- To recall how different people work with light and shadows.	Seed dispersal Knowledge- To explore seed dispersal methods. Working scientifically- To use results to draw conclusions.	None
Vocabulary						
balanced diet bone carbohydrate conclusion fat fibre invertebrate joint	attract bar chart conclusion contact force diagram (Y1) force friction investigation	bar chart conclusion crystal diagram (Y1) fossil grain group (Y1) hard	bar chart cast (a shadow) conclusion group (Y1) investigation light source luminous mirror	bar chart conclusion female flower (Y1) flowering plant fruit (Y1) male pattern (Y2)	bar chart bone carbohydrate conclusion evaluate fat flower fruit	



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measure (Y1) mineral movement muscle nutrient protection protein record research (Y2) skeleton support vertebrate vitamin	magnet magnetic material magnetism method non-contact force north pole plan (Y1) results (Y2) record repel south pole variable	hardness observe (Y1) predict (Y2) record research (Y2) rock sediment sedimentary rock sedimentation soft soil	non-luminous observe (Y1) opaque measure (Y1) mirror patten (Y1) predict (Y2) record reflect reflection reflective (shiny) results table shadow the Sun translucent transparent trustworthy variable Unit resources	pollen pollination predict (Y2) record reproduction results table seed (Y1) seed dispersal transport variable Unit resources	friction grip strength joint light source material muscle nutrition opaque predict property protein seed shadow trustworthy variable
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Year 4	
Disciplinary knowledge and skills	
Autumn 1- Animals: Digestion and Food	Knowledge To know: The main organs of the human digestive system are the mouth, teeth, tongue, oesophagus, stomach, small and large intestines and have different functions. The different types of human teeth are incisors, canines, premolars and molars and have different functions. Teeth can be damaged by sugary and acidic food, for example. It is important to brush your teeth twice a day, make good food choices and visit the dentist regularly. The teeth of carnivores and herbivores are different for a reason. Predators hunt for their food and prey are the animals being hunted. Producers make their own food. Food chains begin with a producer, followed by consumers and arrows to show the energy passed on. <u>Science in action</u>- To know: Famous scientists throughout history. There are a range of jobs and careers that use scientific knowledge and methods. There is work taking place by modern-day scientists. There are spiritual, moral, social and cultural links with science. There are different methods and equipment used by scientists throughout history and these have led to modern methods. Scientific knowledge has changed over time, leading to the current understanding of science. Skills <u>Planning</u>- Beginning to select from options which variables will be changed, measured and controlled. <u>Recording</u>- Beginning to design simple results tables. <u>Grouping and classifying</u>- Grouping based on visible characteristics and measurable properties. <u>Analysing and drawing conclusions</u>- Beginning to suggest how one variable may have affected another. Beginning to use identified patterns to predict new values or trends. <u>Evaluating</u>- Beginning to identify steps in the method that need changing and suggest improvements. Beginning to identify which variables were difficult to control and suggesting how to better control them. Commenting on the degree of trust by reflecting on the quality of results (accurate measurements and maintaining control variables).
Autumn 2- Energy: Electricity and Circuits	Knowledge To know: That all electrical appliances need a power source, including batteries or mains electricity. That an electrical circuit needs a complete path for the electrical charge to flow through. The main components in a series circuit. The precautions for working safely with electricity. That some materials allow electric charge to pass through them quickly and these are known as electrical conductors (e.g. metals).



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	That some materials do not allow electrical charge to pass through them easily and these are known as electrical insulators (e.g wood and plastic). That metals are used for cables and wires because they are good conductors of electricity. That plastic is used to cover cables and wires because it is a good insulator. That an open switch breaks a series circuit so the components will be off. That a closed switch completes a series circuit so the components will be on. The relationship between bulb brightness and the number of bulbs in a circuit. <u>Skills</u> <u>Posing questions</u>- Considering what makes a testable question. Beginning to recognise that there are different types of enquiry and that they are suitable for different questions. Beginning to make suggestions about how different questions could be answered. <u>Planning</u>- Planning a simple method, verbally and in writing. Beginning to write a simple method in numbered steps. Selecting and beginning to decide what simple equipment might be used to aid observations and measurements. <u>Predicting</u>- Making predictions about what they think will happen by predicting a trend by considering how the changing variable will affect the measured variable. <u>Observing</u>- Using their senses to describe, in more detail and with simple scientific vocabulary, what they notice or what has changed. <u>Recording</u>- Beginning to draw scientific diagrams that are in 2D and simple line diagrams. Using a prepared table to record results including more detailed observations. Using tables with more than two columns. Identifying and adding headings to tables. Beginning to design simple results tables. <u>Grouping and classifying</u>- Grouping based on visible characteristics and measurable properties. <u>Analysing and drawing conclusions</u>- Writing a conclusion to summarise findings using simple scientific vocabulary. Beginning to suggest how one variable may have affected another. Beginning to use identified patterns to predict new values or trends.
Spring 1- Materials: States of Matter	<u>Knowledge</u> To know All substances around us can exist as solids, liquids and gases. A property of a solid is that it keeps its shape unless a force is applied to it. A property of a liquid is that it can flow freely and take on the shape of a container. A property of a gas is that it does not have a fixed shape and can escape from an unsealed container. Heating causes solids to turn into liquids (melting) and liquids to turn into gases (evaporating). Cooling causes gases to turn into liquids (condensing) and liquids to turn into solids (freezing). Water can exist as a solid, a liquid or a gas. The melting point of water is zero degrees Celsius and the boiling point of water is 100 degrees Celsius. Water flows around the world in a continuous process called the water cycle. In the water cycle, evaporation is when bodies of water are heated and turn into water vapour. In the water cycle, condensation is the process of water vapour cooling to form water droplets in clouds, which can result in precipitation. The rate of evaporation increases as the temperature rises. <u>Skills</u> <u>Posing questions</u>- Considering what makes a testable question. <u>Measuring</u>- Using standard units to measure and compare. Using measuring equipment with increasing accuracy.



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	<u>Recording-</u> Drawing in 2D to produce simple line diagrams. Labelling diagrams with more scientific vocabulary. <u>Researching-</u> Gathering specific information from a variety of sources. <u>Analysing and drawing conclusions-</u> Beginning to use identified patterns to predict new values or trends. Writing a conclusion to summarise findings using simple scientific vocabulary.
Spring 2- Energy: Sound and Vibration	<u>Knowledge</u> To know: Sound is a result of vibrations. Vibrations from sounds travel through mediums to the ear. An insulating material reduces the amount of vibrations that pass through it and this can be used to protect the ears from damaging sounds. Different materials provide different amounts of insulation against sound. A variety of ways to change the pitch or volume of a sound. Quicker vibrations cause higher-pitched sounds and slower vibrations cause lower-pitched sounds. Stronger vibrations cause louder sounds and weaker vibrations cause quieter sounds. Sounds get fainter as the distance from the sound source increases. <u>Skills</u> <u>Planning-</u> To suggest what observations to make and how long to make them for. <u>Observing-</u> To observe closely how different instruments create a sound. <u>Researching-</u> To research how cetaceans communicate underwater. <u>Recording-</u> To present results using a bar chart. To design simple results tables. <u>Analysing and drawing conclusions-</u> To identify when results or observations do not match predictions.
Summer 1- Living things: Classification and Changing Habitats	<u>Knowledge</u> To know: Living things can be grouped in different ways. A classification key can be used to group and identify plants and animals. Vertebrates are animals that have a backbone and invertebrates are animals that do not have a backbone. Plants can be grouped into flowering or non-flowering varieties. Flowering plants include grasses and non-flowering plants include ferns and mosses. There are five main vertebrate groups: birds, mammals, reptiles, amphibians and fish. Invertebrate groups include snails, slugs, worms, spiders and insects. Habitats can change throughout the year, which can be dangerous for living things. Humans can have both a positive and negative impact on the environment. <u>Skills</u> <u>Observing-</u> Using their senses to describe, in more detail and with simple scientific vocabulary, what they notice or what has changed. <u>Recording-</u> Recording data in Carroll and Venn diagrams. Using a prepared table to record results, including more detailed observations. Using tables with more than two columns.



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	<u>Grouping and classifying</u> - Grouping based on visible characteristics and measurable properties. Populating a pre-prepared branching and number key. Choosing appropriate questions for classification keys. <u>Researching</u> - Gathering specific information from a variety of sources.					
Summer 2- Making connections: How does the flow of liquids compare?	<u>Knowledge</u> This unit revises the following key knowledge from the previous Year 4 units: <u>States of matter</u> - To know: How to compare and group materials together, according to whether they are solids, liquids or gases. The part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. <u>Classification and changing habitats</u> - To know: And use classification keys to help group, identify and name a variety of living things in their local and wider environment. Environments can change and that this can sometimes pose dangers to living things. <u>Electricity and circuits</u> - To know: A switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. Some common conductors and insulators, and associate metals with being good conductors. <u>Sound and vibrations</u> - To know: How sounds are made, associating some of them with something vibrating. Vibrations from sounds travel through a medium to the ear. <u>Digestion and food</u> - To know the simple functions of the basic parts of the digestive system in humans. <u>Skills</u> This unit revisits the working scientifically skills covered in Year 4, including: Posing questions. Planning. Predicting. Observing. Measuring. Recording. Graphing. Analysing and drawing conclusions. Evaluating.					
Learning Foci						
	Autumn 1- Animals: Digestion and Food	Autumn 2- Energy: Electricity and Circuits	Spring 1- Materials: States of Matter	Spring 2- Energy: Sound and Vibration	Summer 1- Living things: Classification and Changing Habitats	Summer 2- Making connections: How does the flow of liquids compare?
LF1	The human digestive system Knowledge- To describe the function of the human digestive system. Working scientifically- To evaluate a model.	Using electricity To recognise how electrical appliances are powered. Working scientifically: To record and classify qualitative data.	Solids Knowledge- To identify solids using their properties. Working scientifically- To ask relevant questions about the properties of solids.	Vibrations Knowledge- To describe how sounds are made. Working scientifically- To observe closely how different	Grouping living things: Vertebrates and invertebrates Knowledge- To group animals in various ways. Working scientifically- To record data in different ways.	Investigating liquids – Planning Knowledge- To revise the units States of matter and Classification and changing habitats. Working scientifically- To plan a comparative test.



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				instruments create a sound.		
LF2	Human teeth Knowledge- To recognise the different types of human teeth and their roles in eating. Science in action- To describe real observation methods and evidence collected.	Building circuits To construct an electrical circuit. Working scientifically- To draw a scientific diagram.	Liquids and gases Knowledge- To identify liquids and gases using their properties. Working scientifically- To use results to draw simple conclusions about the properties of liquids.	Sound waves Knowledge- To describe how sounds are heard through different mediums. Working scientifically- To research how whales and dolphins communicate underwater.	Grouping living things: Plants Knowledge- To group plants in various ways. Working scientifically- To apply and create classification keys.	Investigating liquids – Gathering data Knowledge- To revise the unit Electricity and circuits. Working scientifically- To gather and record data.
LF3	Investigating dental hygiene Knowledge- To explain how to care for our teeth. Working scientifically- To plan an enquiry by considering which variables should be changed, measured and controlled.	Switching on and off To explain the use of switches in a circuit.	Melting and freezing Knowledge- To describe melting and freezing. Working scientifically- To use thermometers to take accurate measurements before and after melting.	Volume Knowledge- To describe the relationship between vibration strength and volume. Working scientifically- To present results using a bar chart.	Classification keys Working scientifically- To make careful observations. To make and use classification keys.	Investigating liquids – Analysing, concluding and evaluating Knowledge- To revise the units States of matter and Sound and vibrations. Working scientifically- To conclude and evaluate the investigation.
LF4	Teeth of carnivores, herbivores and omnivores Knowledge- To recognise that differences in teeth relate to an animal's diet. Working scientifically- To group animals based on their diet.	Investigating electrical conductors and insulators To explain the use of materials as electrical conductors or insulators. Working scientifically- To write a method.	Condensing and evaporating Knowledge- To describe condensing and evaporating. Working scientifically- To make predictions for new values about evaporation rates.	Volume and distance Knowledge- To describe the relationship between volume and distance. Working scientifically- To suggest which variables to measure and for how long.	Habitats and seasonal change Knowledge- To recognise and describe different habitats and their inhabitants. Working scientifically- To gather, record, classify and present data.	Investigating liquids – Extending Knowledge- To revise the unit Digestion and food. Working scientifically- To observe carefully and apply these observations to problem solve.
LF5	Producers, predators and prey in food chains	Investigating bulb brightness	The water cycle	Pitch	Human impacts on habitats	Investigating liquids – Presenting Knowledge- To revise the unit States of matter.



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	Knowledge- To recognise producers, predators and prey in food chains. Working scientifically- To analyse patterns and form conclusions using scientific knowledge.	To investigate what affects bulb brightness. Working scientifically: To pose questions and plan ways to test them.	Knowledge- To describe the different stages of the water cycle. Working scientifically- To record the stages of the water cycle using a labelled diagram.	Knowledge- To describe pitch and how to change it. Working scientifically- To design simple results tables.	Knowledge- To recognise the impact humans can have on habitats. Working scientifically- To research using an information sheet.	Working scientifically- To report on my findings.
LF6	Poo clues Knowledge- To recognise that animal poo can give us clues about digestion, teeth and diet. Working scientifically- To construct a results table for recording observations.	Electrical safety To explain how to be safe around electricity. Science in action: To explore how scientific advances inform safety advice.	Climate change and the water cycle Knowledge- To describe how temperature affects evaporation rates and the water cycle. Working scientifically- To research climate change and the water cycle.	Sound insulation Knowledge- To explain how insulating materials can be used to muffle sound. Working scientifically- To identify when results or observations do not match predictions.	Natural changes to habitats Knowledge- To recognise the impact of natural disasters on habitats.	None
Vocabulary						
canine carnivore (Y1) conclusion (Y3) control variable diagram (Y1) digest digestive system ethics faeces food chain (Y2) fair test group (Y1) herbivore (Y1) incisor large intestine molar mouth nutrient (Y3)	appliance battery/cell bulb buzzer circuit conclusion (Y3) electrical conductor electrical insulator electricity mains method (Y3) motor pattern (Y1) power source predict (Y2) property results table (Y3) switch	boiling conclusion (Y3) condensing diagram (Y1) evaporating evaporation rate freezing gas liquid measure (Y1) melting precipitation predict (Y2) rate research (Y2) solid steam stopwatch (Y3)	air bar chart (Y3) eardrum insulator observe (Y1) pitch plan (Y1) predict (Y2) proof record (Y3) research (Y2) results table (Y3) sound trustworthy (Y3) vibration volume	amphibian (Y1) bird (Y1) classification key classify conservation deforestation endangered fish (Y1) flowering plants (Y3) group habitat (Y2) insect invertebrate (Y3) mammal (Y1) nature reserve non-flowering plants observe (Y1) pollution	bar chart condensing cell/battery conclusion evaluate evaporating gas insect liquid medicine motor pharmacology pharmacologist precipitation predict solid	



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oesophagus omnivore (Y1) pattern (Y1) plan (Y1) predator (Y2) premolar prey (Y2) producer proof record (Y3) results table (Y3) saliva small intestine stomach trustworthy (Y3) variable (Y3)	wire variable (Y3)	temperature thermometer the water cycle		reptile (Y1) research (Y2) snail spider slug vertebrate (Y3) worm	switch temperature the water cycle trustworthy variable viscosity water vapour
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Year 5	
Disciplinary knowledge and skills	
Autumn 1- Materials: Mixtures and Separation	<u>Knowledge</u> To know: Some substances will dissolve in a liquid to form a solution. The factors that affect the time taken to dissolve, including temperature and stirring. Some liquids and solids can be separated using sieving, filtering and evaporation and to describe these processes. <u>Skills</u> <u>Researching</u>- Gathering answers to open-ended questions from a variety of sources. <u>Recording (diagrams)</u>- Labelling with a broader range of scientific vocabulary. Annotating diagrams to explain concepts and convey opinions. <u>Posing questions</u>- Selecting the most appropriate enquiry method to answer questions and give justification. <u>Observing (qualitative data)</u>- Using their senses to describe, in detail and with a broader range of scientific vocabulary, what they notice or what has changed. <u>Planning</u>- Suggesting which variables will be changed, measured and controlled. Making and explaining decisions about what observations to make and how long to make them for.
Autumn 2- Materials: Properties and Changes	<u>Knowledge</u> To describe a broader range of materials and their properties, including hardness, solubility, transparency, conductivity and response to magnets. To know: Dissolving, mixing and changes of state are reversible changes. Some changes result in the formation of new materials, which are usually irreversible (e.g. burning, rusting, the action of acid on bicarbonate of soda). <u>Skills</u> <u>Planning</u>- Writing a method including detail about how to ensure control variables are kept the same. <u>Predicting</u>- Making increasingly scientific predictions by: using previous scientific knowledge and evidence to inform their predictions; using scientific language to describe a potential outcome or explain why they think something will happen; making links between topics to evidence a prediction. <u>Measuring (quantitative data)</u>- Using standard units to measure and compare with increasing precision (decimals). <u>Recording (tables)</u>- Suggesting headings to tables, including units. Designing results tables with increasing independence with consideration of variables where applicable. <u>Analysing and drawing conclusions</u>- Writing a conclusion to summarise findings using increasingly complex scientific vocabulary. <u>Evaluating</u>- Identifying which variables were difficult to control and suggesting how to better control them. Commenting on the degree of trust by also reflecting on: accuracy (human error with equipment); reliability (repeating results).
Spring 1- Forces and space: Earth and Space	<u>Knowledge</u> To know: The Sun is a star at the centre of our Solar System. The Sun, Earth and Moon are approximately spherical bodies.



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	The names, order and relative positions of the planets and other main celestial bodies. A moon is a celestial body that orbits a planet and give examples of moons that orbit other planets. The Earth and other planets orbit around the Sun. The tilt of the Earth and its orbit around the Sun causes the seasons. The Moon orbits around the Earth. How the Earth's rotation causes day and night and the apparent movement of the Sun across the sky. Science in action- To know: To know about famous scientists throughout history. To know how scientific knowledge has changed over time, leading to the current understanding of Science. To know that mistakes can lead to new discoveries. To know about the work of modern day scientists. To know about science in the news and recent discoveries. To know about the methods and equipment used by scientists throughout history and how these have led to modern methods. To know about current scientific research and what it aims to achieve in the future. To know that collaboration and peer reviewing is essential for effective scientific progress. <u>Skills</u> <u>Posing questions</u>- Raising questions throughout the enquiry process. Identifying testable questions. Selecting the most appropriate enquiry method to answer questions and give justification. <u>Recording</u>- Drawing scientific diagrams by: Using a wider range of standard symbols. Drawing with increasing accuracy. Labelling with a broader range of scientific vocabulary. Annotating diagrams to explain concepts and convey opinions. Suggesting headings to tables, including units. Designing results tables with increasing independence with consideration of variables where applicable. <u>Analysing and drawing conclusions</u>- Using identified patterns to predict new values or trends.
Spring 2- Living things: Lifecycles and Reproduction	<u>Knowledge</u> To know: A life cycle shows the changes an animal or plant goes through until the reproduction of a new generation when the cycle starts again. All living things must reproduce for the species to survive. Sexual reproduction requires two parents whereas asexual reproduction only requires one parent. There are different processes plants and animals use to reproduce (asexual and sexual reproduction). <u>Science in action</u>- To know: There are a range of jobs and careers that use scientific knowledge and methods. There is current scientific research taking place with aims for achievement in the future. Scientific evidence is used to support or refute ideas or arguments. <u>Skills</u> <u>Posing questions</u>- Raising questions throughout the enquiry process. Identifying testable questions.



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	<u>Planning</u>- Suggesting which variables will be changed, measured and controlled. Making and explaining decisions about what observations to make and how long to make them for. <u>Observing</u>- Using their senses to describe, in detail and with a broader range of scientific vocabulary, what they notice or what has changed. <u>Measuring</u>- Using standard units to measure and compare with increasing precision (decimals). <u>Researching</u>- Gathering answers to open-ended questions from a variety of sources. <u>Recording</u>- Representing data by using line graphs and scatter graphs. Plotting points with greater accuracy. Reading the value of plotted points with greater accuracy. <u>Analysing and drawing conclusions</u>- Suggesting with increasing independence how one variable may have affected another. Quoting relevant data as evidence of relationships. Using identified patterns to predict new values or trends.
Summer 1- Forces and space: Unbalanced Forces	<u>Knowledge</u> To know: Gravity is a non-contact force that pulls objects together. Air resistance and water resistance are both types of friction. Unsupported objects fall towards the Earth because of gravity. Friction, air resistance and water resistance act in the opposite direction of a moving object. When forces are unbalanced, the speed, shape or direction of an object changes. When forces are balanced, the speed, shape or direction of an object stays the same. Some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. Rougher surfaces have more friction between them than smoother surfaces and how that may affect movement. The larger the surface area of an object, the greater the air or water resistance it creates. <u>Science in action</u>- To know: About famous scientists throughout history. <u>Skills</u> <u>Planning</u>- Suggesting which variables will be changed, measured and controlled. Making and explaining decisions about what observations to make and how long to make them for. Writing a method that includes details about how to ensure control variables are kept the same. Writing a method that considers reliability by planning repeated readings. Suggesting the most appropriate equipment to make observations and measurements and justifying their choices. <u>Measuring</u>- Using standard units to measure and compare with increasing precision (decimals). Reading a wider variety of scales with unmarked intervals between numbers. <u>Recording</u>- Drawing scientific diagrams by: using a wider range of standard symbols; drawing with increasing accuracy; labelling with a broader range of scientific vocabulary; annotating diagrams to explain concepts and convey opinions. Using tables with columns that allow for repeat readings. Suggesting headings to tables, including units. Designing results tables with increasing independence with consideration of variables where applicable. Calculating the mean average. <u>Graphing</u>- Representing data by using line graphs and scatter graphs. Plotting points with greater accuracy. Reading the value of plotted points with greater accuracy.



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	<u>Analysing and drawing conclusions-</u> Writing a conclusion to summarise findings using increasingly complex scientific vocabulary. Suggesting with increasing independence how one variable may have affected another. Quoting relevant data as evidence of relationships. Identifying anomalies in repeat data and excluding results where appropriate. Comparing individual, class and/or model data to the prediction and recognising when they do not match. Using identified patterns to predict new values or trends. <u>Evaluating-</u> Identifying steps in the method that need changing and suggesting improvements. Identifying which variables were difficult to control and suggesting how to control them better. Commenting on the degree of trust by also reflecting on: accuracy (human error with equipment); reliability (repeating results); sources of information (e.g. websites, books). Deciding what data to collect to test direct relationships further.
Summer 2- Animals: Human timeline Making connections: Does the size of an asteroid affect its impact strength?	<u>Human Timeline</u> <u>Knowledge</u> To know: How to describe the human life cycle, including the stages of growth and development (baby, toddler, child, teenager, adult, elderly). How to describe changes that occur during puberty (in boys and girls). Gestation periods vary across mammals. <u>Science in action-</u> To know: A range of jobs and careers that use scientific knowledge and methods. The methods and equipment used by scientists throughout history and how these have led to modern methods. <u>Skills</u> <u>Graphing-</u> Representing data by using line graphs and scatter graphs. Plotting points with greater accuracy. Reading the value of plotted points with greater accuracy. <u>Analysing and drawing conclusions-</u> Writing a conclusion to summarise findings using increasingly complex scientific vocabulary. Suggesting with increasing independence how one variable may have affected another. Quoting relevant data as evidence of relationships. Using identified patterns to predict new values or trends. <u>Evaluating-</u> Commenting on the degree of trust by also reflecting on the sources of information (e.g. websites, books). Deciding what data to collect to further test direct relationships. <u>Does the size of an asteroid affect its impact strength?</u> <u>Knowledge</u> This unit revises the following key knowledge from the previous Year 5 units: <u>Earth and space-</u> To know: The movement of the Earth, and other planets, relative to the Sun in the solar system. The Sun, Earth and Moon are approximately spherical bodies. <u>Life cycles and reproduction-</u> To know the differences in the life cycles of a mammal, an amphibian, an insect and a bird. <u>Properties and changes-</u> To understand how to compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets.



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Unbalanced forces- To know:
 Unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.
 The effects of air resistance, water resistance and friction, that act between moving surfaces.

Mixtures and separation- To understand how to use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.

Skills
 This unit revisits the working scientifically skills covered in Year 5, including:
 Posing questions. Planning. Predicting. Observing. Measuring. Recording. Graphing. Analysing and drawing conclusions. Evaluating.

Learning Foci

	Autumn 1- Materials: Mixtures and Separation	Autumn 2- Materials: Properties and Changes	Spring 1- Forces and Space: Earth and Space	Spring 2- Living things: Lifecycles and Reproduction	Summer 1- Forces and space: Unbalanced Forces	Summer 2- Animals: Human timeline (3) Making connections: Does the size of an asteroid affect its impact strength? (3)
LF1	Mixtures Knowledge- To describe mixtures. Working scientifically- To research using a range of secondary resources.	Hardness Knowledge- To determine the hardness of materials and link this to their uses. Working scientifically- To evaluate the hardness test to determine the degree of trust in the results.	Models of our Solar System Knowledge- To compare the contributions of Ptolemy, Alhazen and Copernicus to models of the Solar system. Working scientifically- To pose testable questions about the solar system.	Life cycles and reproduction in plants Knowledge- To describe the life cycle of a plant, including the reproductive stage. Working scientifically- To observe and compare equivalent parts in different flowers.	Gravity Knowledge To describe gravity and its effects. Working scientifically To analyse data to write a conclusion.	Growing old Knowledge- To describe how humans change from babies through to old age. Working scientifically- To use a line graph to identify patterns in height and predict values.
LF2	Sieving Knowledge- To explain the process of sieving. Working scientifically- To draw and annotate a diagram to explain a concept.	Transparency Knowledge- To determine the transparency of different materials and link this to their uses. Working scientifically- To plan and draw a table of results.	Our Solar System Knowledge- To describe the movement and shapes of the celestial bodies in our Solar System. Working scientifically- To develop a model to represent the Solar System.	Life cycle of a mammal Knowledge- To describe the life cycle of a mammal. Working scientifically- To research the life cycles of different mammals.	Air resistance Knowledge To describe air resistance and its effects. Working scientifically To plan a fair test to investigate air resistance.	Puberty Knowledge- To identify changes in males and females as a result of puberty.
LF3	Filtering	Conductivity	The Moon	Life cycle of a bird	Water resistance	Comparing human gestation



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	Knowledge- To explain the process of filtering. Working scientifically- To identify testable questions and how to answer them.	Knowledge- To determine the conductivity of different materials and link this to their uses. Working scientifically- To write a detailed, organised method that is easy to follow.	Knowledge- To describe the movement of the Moon relative to the Earth. Working scientifically- To design and draw a table.	Knowledge- To describe the life cycle of a bird and compare it with that of a mammal. Working scientifically- To pose questions to compare the life cycles of different birds.	Knowledge To describe water resistance and its effects. Working scientifically To design a results table.	Knowledge- To explore the gestation periods of humans and other animals. Working scientifically- To plot data on a scatter graph.
LF4	Solutions Knowledge- To describe solutions and how they can be identified. Working scientifically- To make observations about solutions.	Reversible changes Knowledge- To demonstrate reversible changes. Working scientifically- To write a prediction using prior knowledge of the states of matter.	Day and night Knowledge- To explain the causes of day and night and the seasons. Working scientifically- To draw a diagram to explain day and night.	Life cycle of an amphibian Knowledge- To describe the life cycle of an amphibian. Working scientifically- To suggest how temperature may affect egg hatching.	Friction Knowledge To describe friction and its effects. Working scientifically To evaluate a method.	Investigating asteroid craters – Planning Knowledge- To revise the units Earth and space and Life cycles and reproduction. Working scientifically- To plan a comparative test.
LF5	Dissolving Knowledge- To identify which factors affect the time taken to dissolve. Working scientifically- To plan a fair test with consideration of variables and measurements.	Irreversible changes: Burning and rusting Knowledge- To demonstrate irreversible changes. Working scientifically- To analyse observations about rusting and use them to support a conclusion.	Time Knowledge- To devise a sundial to tell the time. Working scientifically- To calibrate and use a sundial to measure time.	Life cycle of an insect Knowledge- To describe the life cycle of an insect and compare it with that of an amphibian. Working scientifically- To use data to describe a relationship and make predictions.	Levers, pulleys and gears (Part 1) Knowledge To describe the effects of levers, pulleys and simple machines on movement. Working scientifically To draw and label a diagram.	Investigating asteroid craters – Gathering data Knowledge- To revise the units Unbalanced forces and Mixtures and separation. Working scientifically- To gather and record data.
LF6	Evaporating Knowledge- To describe the process of evaporation.	Irreversible changes: Mixing Knowledge- To demonstrate irreversible changes. Working scientifically- To measure the	Satellites and space junk Science in action- To describe some uses of satellites and the problems posed by space junk.	Asexual reproduction in plants Knowledge- To describe asexual reproduction in plants.	Levers, pulleys and gears (Part 2) Knowledge To describe the relationship between lever length and effort.	Investigating asteroids – Analysing, concluding and evaluating Knowledge- To revise the units Separating mixtures and Unbalanced forces.



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		circumference of a balloon accurately.	Working scientifically- To use temperature data to make predictions about climate change.	Working scientifically- To represent root growth over time on a line graph.	Working scientifically To draw an accurate line graph.	Working scientifically- To conclude and evaluate the investigation.
Vocabulary						
control variable (Y4) dissolve evaporation filtering insoluble mixture sieving soluble solution stopwatch (Y3) variable (Y3)	burning control variable (Y4) conductor electrical conductivity (Y4) hardness (Y3) hazard insulator irreversible change method (Y3) reversible change rust rusting safety thermal conductivity transparency trustworthy (Y3) variable (Y3)	celestial bodies data day (daytime) degrees Celsius (Y4) discovery Earth evidence gravity Jupiter line graph line of best fit Mars Mercury model moon Neptune night (nighttime) orbit phase planet Pluto Saturn season (Y1) solar system spherical star temperature (Y4) testable Uranus Venus	adolescence amphibian (Y1) asexual reproduction bird (Y1) characteristic data estimate fertilisation germination gestation gills incubation insect life cycle (Y2) line graph line of best fit lungs mammal (Y1) mating metamorphosis offspring ovule pollen pollination reproduction (Y3) sexual reproduction testable	air resistance anomaly balanced control variable (Y4) data force (Y3) friction (Y3) gear gravity lever line graph line of best fit pivot pulley relationship surface area trustworthy (Y3) unbalanced variable (Y3) water resistance	<u>Human Timeline</u> anomaly evidence foetus gestation period hormones life cycle line graph old age period (menstruation) puberty rate (Y3) relationship <u>Does the size of an asteroid affect its impact strength?</u> accurate air resistance asteroid celestial bodies conclusion crater diameter evaluate fair test force gravity hardness material predict property spherical reliable	



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					trustworthy variable
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Year 6	
Disciplinary knowledge and skills	
Autumn 1- Living things: Classifying big and small	<u>Knowledge</u> To know that 'organism' is a term used to refer to an individual living thing. To know that micro-organisms are incredibly small and cannot usually be seen by the naked eye. To know the characteristics of the different groups of vertebrates and commonly found invertebrates. Science in action- To know about famous scientists throughout history. <u>Skills</u> Grouping and classifying: Grouping in a broader range of contexts. Organising the layout of number and branching keys. Formulating appropriate questions for classification keys.
Autumn 2- Energy: Light and reflection	<u>Knowledge</u> To know: Light travels in a straight line from a light source. Luminous objects are seen as a result of light directly entering the eye, whereas non-luminous objects reflect light into the eye. Shiny surfaces reflect light uniformly. When light is reflected off a surface, its direction changes. Mirrors and periscopes work using reflection of light on smooth surfaces. Shadows have the same shape as the objects that cast them as a result of light travelling in straight lines. There are relationships between light sources, objects and shadows. The distance between the object and the screen affects the size of the shadow. The angle of a reflected ray is affected by the angle of the incoming ray on a smooth surface. <u>Skills</u> <u>Posing questions</u>- Identifying testable questions. Selecting the most appropriate enquiry method to answer questions and give justification. <u>Planning</u>- Suggesting which variables will be changed, measured and controlled. Writing a method including detail about how to ensure control variables are kept the same. <u>Observing</u>- Using their senses to describe, in detail and with a broader range of scientific vocabulary, what they notice or what has changed. <u>Measuring</u>- Using standard units to measure and compare with increasing precision (decimals). Reading a wider variety of scales with unmarked intervals between numbers. <u>Recording</u>- Drawing scientific diagrams with increasing accuracy, labelling with a broader range of scientific vocabulary and annotating diagrams to explain concepts and convey opinions. Using tables with columns that allow for repeat readings. Calculating the mean average. Graphing- Representing data by using line graphs and scatter graphs. Plotting points with greater accuracy. Reading the value of plotted points with greater accuracy.



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	<u>Analysing and drawing conclusions</u>- Writing a conclusion to summarise findings using increasingly complex scientific vocabulary. Suggesting with increasing independence how one variable may have affected another. Identifying anomalies in repeat data and excluding results where appropriate. Using identified patterns to predict new values or trends. <u>Evaluating</u>- Identifying steps in the method that need changing and suggesting improvements. Identifying which variables were difficult to control and suggesting how to control them better. Commenting on the degree of trust by reflecting on accuracy (human error with equipment) and reliability (repeating results).
Spring 1- Living things: Evolution and inheritance	<u>Knowledge</u> To know: Living things have changed over time. Fossils provide information about living things that inhabited the Earth millions of years ago. Characteristics are passed from parents to their offspring, but all offspring vary from their parents. Over time, variation in offspring can affect animals' chances of survival in particular environments. Animals and plants have adapted to suit their environment over many millions of years and this process can be called evolution. <u>Science in action</u>- To know: Famous scientists throughout history. A range of jobs and careers use scientific knowledge and methods. The work of modern-day scientists. There are spiritual, moral, social and cultural links with Science. Methods and equipment used by scientists throughout history and how these have led to modern methods. Scientific knowledge has changed over time, leading to the current understanding of Science. Collaboration and peer reviewing are essential for effective scientific progress. Scientific evidence is used to support or refute ideas or arguments. <u>Skills</u> <u>Posing questions</u>- Raising questions throughout the enquiry process. Selecting the most appropriate enquiry method to answer questions and give justification. <u>Planning</u>- Suggesting which variables will be changed, measured and controlled. <u>Observing</u>- Using senses to describe, in detail and with a broader range of scientific vocabulary, what is noticed or what has changed. <u>Recording</u>- Using tables with columns that allow for repeat readings. Calculating the mean average. <u>Grouping and classifying</u>- Grouping in a broader range of contexts. <u>Analysing and drawing conclusions</u>- Suggesting with increasing independence how one variable may have affected another. Quoting relevant data as evidence of relationships. Identifying anomalies in repeat data and excluding results where appropriate. Comparing individual, class and/or model data to the prediction and recognising when they do not match. <u>Evaluating</u>- Identifying steps in the method that need changing and suggesting improvements. Identifying which variables were difficult to control and suggesting how to control them better. Commenting on the degree of trust by reflecting on accuracy (human error with equipment) and reliability (repeating results). Posing new questions in response to the data that would extend the enquiry.
Spring 2- Energy: Circuits,	<u>Knowledge</u> To know:



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batteries and switches	A variety of components in a series circuit (including buzzer and motor). Conventions are used to draw circuit diagrams, including the recognised symbols for common components and using straight lines. The voltage of a circuit can be changed and this affects bulb brightness (or buzzer volume). Science in action- To know: A range of jobs and careers that use scientific knowledge and methods. How scientific evidence is used to support or refute ideas or arguments. Skills <u>Planning</u>- Suggesting which variables will be changed, measured and controlled. Writing a method including details about ensuring control variables are kept the same. Writing a method that considers reliability by planning repeated readings. Suggesting the most appropriate equipment to make observations and measurements and justifying their choices. <u>Predicting</u>- Using previous scientific knowledge and evidence to inform their predictions. Using scientific language to describe a potential outcome or explain why they think something will happen. <u>Observing and measuring</u>- Using their senses to describe, in detail and with a broader range of scientific vocabulary, what they notice or what has changed. Using standard units to measure and compare with increasing precision (decimals). Reading a wider variety of scales with unmarked intervals between numbers. <u>Recording</u>- Drawing scientific diagrams by using a wider range of standard symbols and drawing with increasing accuracy. Using tables with columns that allow for repeat readings. Suggesting headings to tables, including units. Designing results tables with increasing independence with consideration of variables where applicable. Calculating the mean average. <u>Analysing and drawing conclusions</u>- Writing a conclusion to summarise findings using increasingly complex scientific vocabulary. Suggesting with increasing independence how one variable may have affected another. Quoting relevant data as evidence of relationships. Identifying anomalies in repeat data and excluding results where appropriate. Comparing individual, class and/or model data to the prediction and recognising when they do not match. Using identified patterns to predict new values or trends. <u>Evaluating</u>- Identifying steps in the method that need changing and suggesting improvements. Identifying which variables were difficult to control and suggesting how to control them better.
Summer 1- Animals: Circulation and health	<u>Knowledge</u> To know: The main parts of the human circulatory system (heart, blood vessels and blood). The heart pumps blood around the body. Blood vessels transport blood around the body. Blood transports vital substances around the body, including oxygen and nutrients. The relationships between different organ systems. The impact of diet, exercise, drugs and lifestyle on the way a body functions. The heart rate is the number of beats per minute. Exercise increases heart rate. <u>Science in action</u>- To know:



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	There are famous scientists throughout history. There are a range of jobs and careers that use scientific knowledge and methods. Science is in the news with recent discoveries. There are spiritual, moral, social and cultural links with Science. There were methods and equipment used by scientists throughout history and these have led to modern methods. Scientific knowledge has changed over time, leading to the current understanding of Science. Current scientific research is taking place with specific aims for the future. <u>Skills</u> <u>Planning-</u> Suggesting which variables will be changed, measured and controlled. Making and explaining decisions about what observations to make and how long to make them for. Writing a method including detail about how to ensure control variables are kept the same. Writing a method that considers reliability by planning repeated readings. Suggesting the most appropriate equipment to make observations and measurements and justifying their choices. <u>Predicting-</u> Making increasingly scientific predictions by using previous scientific knowledge and evidence to inform their predictions, using scientific language to describe a potential outcome or explain why they think something will happen and making links between topics to evidence a prediction. <u>Observing-</u> Using their senses to describe, in detail and with a broader range of scientific vocabulary, what they notice or what has changed. <u>Measuring-</u> Using standard units to measure and compare with increasing precision (decimals). Reading a wider variety of scales with unmarked intervals between numbers. <u>Researching-</u> Gathering answers to questions from a variety of sources. <u>Recording (tables)-</u> Using tables with columns that allow for repeat readings. Suggesting headings to tables, including units. Designing results tables with increasing independence with consideration of variables where applicable. Calculating the mean average. <u>Graphing-</u> Representing data by using line graphs and scatter graphs. Plotting points with greater accuracy. Reading the value of plotted points with greater accuracy. <u>Analysing and drawing conclusions-</u> Recognise the following across a broader range of contexts and in more complexity: naturally occurring patterns and relationships, changes over time and relevant secondary data. Writing a conclusion to summarise findings using increasingly complex scientific vocabulary. Suggesting with increasing independence how one variable may have affected another. Quoting relevant data as evidence of relationships. Identifying anomalies in repeat data and excluding results where appropriate. Comparing individual, class and/or model data to the prediction and recognising when they do not match. Using identified patterns to predict new values or trends. <u>Evaluating-</u> Commenting on the degree of trust by also reflecting on the reliability (repeating results) and sources of information (e.g. websites, books).
Summer 2- Making connections: Are some sunglasses safer than others?	<u>Knowledge</u> This unit revises key knowledge from the Year 6 units. <u>Classifying big and small-</u> To know the characteristics of the different groups of vertebrates and commonly found invertebrates. <u>Light and reflection-</u> To know: When light is reflected off a surface, its direction changes. Luminous objects are seen as a result of light directly entering the eye, whereas non-luminous objects reflect light into the eye. <u>Evolution and inheritance-</u> To know: Characteristics are passed from parents to their offspring, but all offspring vary from their parents. Animals and plants have adapted to suit their environment over many millions of years and this process can be called evolution. Over time, variation in offspring can affect animals' chances of survival in particular environments. <u>Circuits, batteries and switches-</u> To know:



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A variety of components in a series circuit (including buzzer and motor). Conventions are used to draw circuit diagrams, including the recognised symbols for common components and using straight lines.

Circulation and health- To know the impact of diet, exercise, drugs and lifestyle on the way a body functions.

Science in action- To know:

There are spiritual, moral, social and cultural links with Science. A range of jobs and careers use scientific knowledge and methods. The work of modern-day scientists. Scientific evidence is used to support or refute ideas or arguments. Current scientific research is taking place with specific aims for the future.

Skills

This unit revisits the working scientifically skills covered in Year 6, including:

Posing questions. Planning. Predicting. Observing. Measuring. Recording. Graphing. Analysing and drawing conclusions. Evaluating.

Learning Foci

	Autumn 1- Living things: Classifying big and small	Autumn 2- Energy: Light and reflection	Spring 1- Living things: Evolution and inheritance	Spring 2- Energy: Circuits, batteries and switches	Summer 1- Animals: Circulation and health	Summer 2- Making connections: Are some sunglasses safer than others?
LF1	Carl Linnaeus and classification To explain how organisms are classified using the Linnaean system.	The pathway of light To describe the pathway of light. Working scientifically- To use evidence to form conclusions.	Variation Knowledge- To explain why there are differences within a species. Working scientifically- To group factors.	Components and circuits Knowledge- To use recognised symbols for electrical components.	Factors affecting health Knowledge- To identify factors that affect our health and how to reduce their negative impact. Working scientifically- To evaluate sources of information.	Investigating sunglasses – Planning Knowledge- To revise the units Circulation and health and Light and reflection. Working scientifically- To plan a comparative test.
LF2	Cold-blooded vertebrates To classify the cold-blooded vertebrate groups using their common characteristics.	See the light To describe how we see. Working scientifically- To draw scientific diagrams.	Inheritance Knowledge- To recognise the inheritance of characteristics in plants and animals.	Circuit diagrams Knowledge- To predict and present results for electrical circuits. Working scientifically- To use standardised symbols when drawing diagrams.	The heart and circulatory system Knowledge- To summarise the key structures and purpose of the circulatory system.	Investigating sunglasses – Gathering data Knowledge- To revise the units Light and reflection and Circuits, batteries and switches. Working scientifically- To gather and record data.
LF3	Warm-blooded vertebrates To classify the warm-blooded vertebrate groups using their common characteristics.	Measuring shadows To explain how shadows change. Working scientifically- To pose questions.	Adaptations Knowledge- To explain why adaptation is necessary.	Current and resistance Knowledge- To recognise a link between the number of components and resistance.	Blood Knowledge- To identify the key roles of blood. Working scientifically- To evaluate a model.	Investigating sunglasses – Analysing, concluding and evaluating Knowledge- To revise the units Light and reflection and Circulation and health.



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				Working scientifically- To explain results using scientific knowledge.		Working scientifically- To conclude and evaluate the investigation.
LF4	Invertebrates To classify invertebrates.	Reflecting light To investigate what affects the angle of the reflected ray. Working scientifically- To record results as a line graph.	Modelling natural selection Knowledge- To model how natural selection affects population size. Working scientifically- To evaluate the degree of trust and pose new questions for further enquiry.	Batteries and voltage Knowledge- To identify ways to change voltage within an electrical circuit. Working scientifically- To design a results table.	Heart rate Knowledge- To explore the relationship between animal size and heart rate. Working scientifically- To interpret patterns in data.	Investigating sunglasses – Extending Knowledge- To revise the units Classifying big and small, Evolution and inheritance, Light and reflection and Circulation and health. Working scientifically- To use further data to inform a conclusion.
LF5	Plants To describe how the plant kingdom is organised (based on shared characteristics). Working scientifically: To produce a working classification key.	Making a periscope To explain how a periscope works.	Evolution Knowledge- To describe the theory of evolution. Working scientifically- To consider evidence used to inform theories.	Voltage and bulb brightness Knowledge- To investigate how voltage affects bulb brightness. Working scientifically- To plan an enquiry.	Investigating exercise and heart rate Knowledge- To investigate the relationship between exercise and heart rate. Working scientifically- To write a method.	Investigating sunglasses – Presenting Knowledge- To revise the units Light and reflection and Circulation and health. Working scientifically- To report on findings in the form of an advert.
LF6	Micro-organisms To describe and classify micro-organisms.	Using mirrors To explain how mirrors are helpful. Science in action- To explore different jobs or inventions that depend on reflection.	Evidence for evolution Knowledge- To recognise evidence that can be used for evolution. Working scientifically- To consider the degree of trust in the evidence used.	Practical circuits Knowledge- To apply knowledge of circuits and components to a practical solution. Science in action- To recognise that scientific knowledge can solve a problem.	Heart rate and fitness Knowledge- To describe the relationship between heart rate and fitness. Working scientifically- To draw a line graph.	None
Vocabulary						
amphibian (Y1) bird (Y1) characteristic (Y5) classification key (Y4) classify (Y4)		anomaly (Y5) cast (Y3) conclusion (Y3) control variable (Y4) evaluate	adaptation anomaly (Y5) characteristic (Y5) competition control variable (Y4)	anomaly (Y5) battery (Y4) bulb (Y4) buzzer (Y4) cell	anomaly (Y5) balanced diet (Y3) blood bloodstream blood vessels	adaptation amphibian bar chart bird bulb



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cold-blooded conifer exoskeleton fern fish (Y1) flowering plant (Y3) insect (Y5) invertebrate (Y3) life processes (Y2) mammal (Y1) micro-organism moss organism reptile (Y1) snail (Y4) spider (Y4) vertebrate (Y3) warm-blooded worm (Y4)	evidence (Y5) fair test light ray light source (Y3) line graph (Y5) line of best fit (Y5) luminous (Y3) mean average mirror (Y3) non-luminous (Y3) opaque (Y3) pupil ray diagram reflect (Y3) reflective relationship (Y5) reliable scale shadow (Y3) testable (Y5) units variable (Y3)	environment environmental evaluate evidence (Y5) evolution extinct fossil (Y3) gene habitat (Y2) inherit inheritance mean average model (Y5) natural selection offspring (Y5) parent (biological) population reliable reproduce (Y5) scientific theory selective breeding survival of the fittest variable (Y3) variation	circuit (Y4) circuit diagram control variable (Y4) current data (Y5) electricity (Y4) evaluate evidence (Y5) fair test hazard (Y5) mean average model (Y5) motor (Y4) power source (Y4) relationship (Y5) resistance safety (Y5) switch (Y4) units variable (Y3) voltage wire (Y4)	carbon dioxide circulatory system control variable (Y4) data (Y5) drug evaluate evidence (Y5) fair test heart heart rate line graph (Y5) lungs (Y5) mean average model (Y5) oxygen pulse rate (Y4) relationship (Y5) reliable secondary source trustworthy (Y3) variable (Y3)	characteristic circuit circuit diagram classify component conclusion control variable electrical circuit evaluate evidence fish habitat health inherit insect invertebrate lifestyle light ray light source luminous mammal method opaque predict reflection refute reptile support translucent transparent trustworthy ultraviolet unit variable vertebrate
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