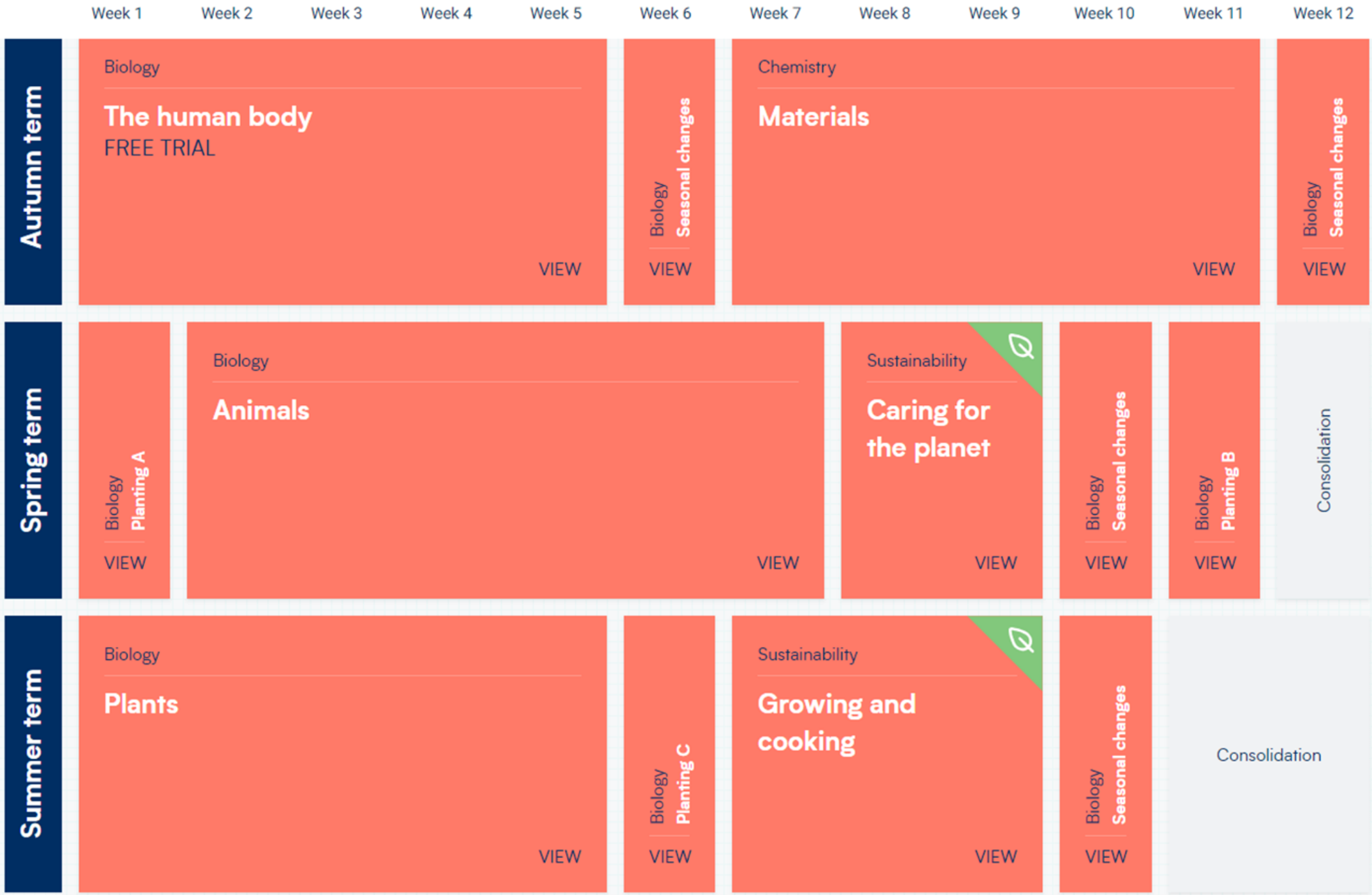
Science at Langley Park Primary School

Medium-Term Planning

Year 1

Autumn	Spring	Summer
Biology: The human body Biology: Seasonal Changes Autumn Chemistry: Materials Biology: Seasonal Changes Winter	Biology: Planting A Biology: Animals Sustainability: Caring for the planet Biology: Seasonal Changes Spring Biology: Planting B	Biology: Plants Biology Planting C Sustainability: Growing and cooking Biology: Seasonal Changes Summer


Week 1
Week 2
Week 3
Week 4
Week 5
Week 6
Week 7
Week 8
Week 9
Week 10
Week 11
Week 12
Autumn term
Biology
The human body
FREE TRIAL
VIEW
Biology
Seasonal changes
VIEW
Chemistry
Materials
VIEW
Biology
Seasonal changes
VIEW
Spring term
Biology
Planting A
VIEW
Biology
Animals
VIEW
Sustainability
Caring for the planet
VIEW
Biology
Seasonal changes
VIEW
Biology
Planting B
VIEW
Consolidation
Summer term
Biology
Plants
VIEW
Biology
Planting C
VIEW
Sustainability
Growing and cooking
VIEW
Biology
Seasonal changes
VIEW
Consolidation

Topic Context

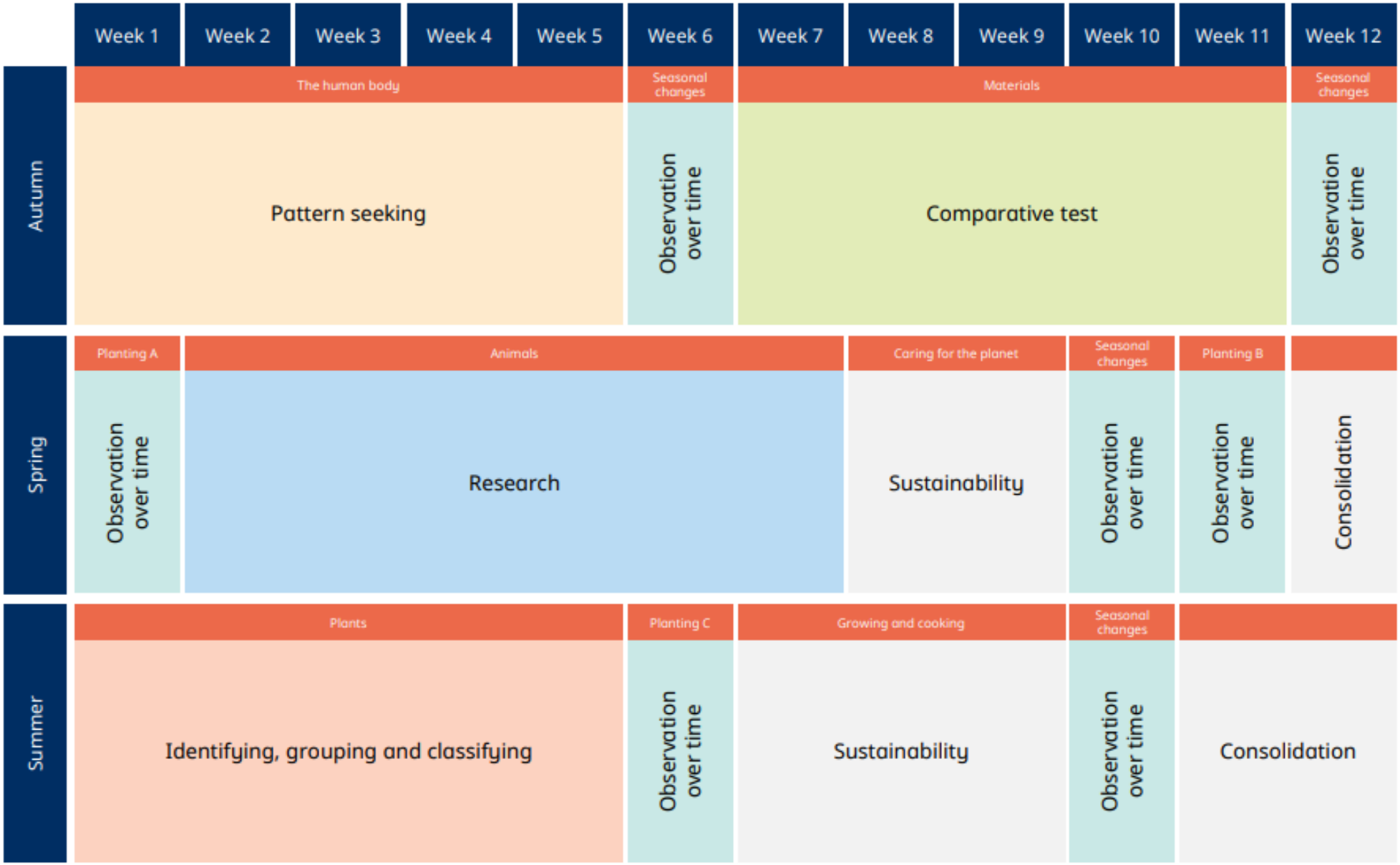
The curriculum begins in the Autumn Term with 'The Human Body', as it is topic pupils are already highly familiar with. Within this block, pupils can draw upon their own knowledge and experiences to help them identify and name body parts and explore their five senses.

'Seasonal Changes' is divided into blocks throughout the year. This approach allows pupils to directly experience seasonal shifts and utilize their local environment to support their understanding. Additionally, in the Spring and Summer Terms, dedicated planting blocks enable pupils to observe how the plants they have grown change and develop over time.

The 'Animals' topic is taught in the Spring Term. This sequencing is intentional as the language demands for this unit become more complex, providing pupils with sufficient time to use and develop their scientific vocabulary during the Autumn term before being introduced to terms such as: carnivore, herbivore, and omnivore in the Spring.

Finally, in the Summer Term, pupils focus on 'Plants'. This timing is ideal because the warmer weather provides a better opportunity for them to identify and observe plant life in their local area.

Enquiry Types Mapped



Unit Summary	
Term	**Autumn (7 Lessons)**
Topic	**Biology: The human body**
The Big Picture	In this unit, pupils learn to identify, name, draw, and label basic body parts, such as the head, arms, legs, and facial features. They explore the five senses—sight, hearing, touch, taste, and smell—and learn which part of the body is associated with each. The unit focuses on developing scientific enquiry skills through hands-on activities and simple tests, encouraging children to observe, ask questions, and draw conclusions. A key investigation involves exploring the question, "Do the oldest children have the longest feet?" Throughout the block, children build vocabulary, practise using their senses to gather information, and begin to notice patterns in what they observe.
Key Knowledge	• Parts of the body • Five senses • Which body parts are used for each sense
Enquiry Question	Do the oldest children have the longest feet?
Enquiry Type	Pattern Seeking

Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**Identify and name parts of the human body** Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	Working scientifically – Asking simple questions and recognising that they can be answered in different ways.	In this small step, children build on previous knowledge to identify and name a more extensive range of parts of the body. By the end of this step, children need to be able to identify the head, neck, arms, elbows, hands, legs, knees, feet, face, ears, eyes, nose, hair, mouth and teeth. Over the next two steps, children complete a simple pattern-seeking enquiry to explore whether the oldest children have the longest feet. At this point in the term, children have not yet looked at measuring length in centimetres. It is therefore more appropriate to draw around feet so that children can put the outlines in order from longest to shortest.	hair, eye, nose, mouth, face, ear, teeth, head, neck, elbow, arm, hand, knee, leg, foot	Children may think that age determines size. Children can use different names for the same part of the body. For example, the area between the chest and hips can be called the stomach, tummy or belly.
2	**Draw and label parts of the human body.**	Working scientifically – Using their observations and	In this small step, children build on the knowledge taught in the previous lesson to draw and label parts of the body correctly. In the previous step, children began a simple pattern-seeking enquiry to explore whether the oldest	hair, eye, nose, mouth, face, ear, teeth, head, neck,	Children may struggle to identify who is older/younger.

	Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	ideas to suggest answers to questions.	children have the longest feet. They drew around their feet and ordered their footprints from longest to shortest. In this step, children identify simple patterns within the data they collected. They should identify the oldest and youngest children and state whether they have the longest or shortest feet. Children make simple written or verbal conclusions to show their findings.	elbow, arm, hand, knee, leg, foot	Line children up in order from oldest to youngest to support them with this. Children may find it difficult to spot patterns in data. Order the footprints from longest to shortest. Match the footprints to the line order of the children.
3	**Sight** Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	Working scientifically − Performing simple tests.	In this small step, children explore sight. They identify that humans use their eyes to see. Children should be encouraged to look at their own eyes in a mirror to identify their eye colour and any similarities and differences between their eyes and the eyes of others. Children perform simple tests to investigate sight further. These are highlighted in the “Practical ideas” section. They repeat investigations, each time limiting their ability to see. Children discuss whether this influences the outcome of the task.	eyes, light, dark, blind	Children may not have experienced true darkness and therefore think humans can see in the dark. Some children may think that sight is not affected when one eye is covered. Ask children to say what they can see when one eye is covered compared to what they can see with both eyes. Children may not recognise that some people have a visual impairment and cannot see well, or that some people cannot see

					at all and are therefore blind.
4	**Sound** Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	Working scientifically − Performing simple tests.	In this small step, children continue to look at the five senses and focus on hearing. They identify that humans use their ears to hear sounds. This step lends itself to practical activities such as sound walks and playing different instruments. Children identify the source of a sound played to them and develop their vocabulary to describe different sounds. In this step, there are links to the “abstraction counting principle” covered in Reception maths. Children can count claps they hear, or the sound of items being dropped into an opaque bucket.	ears, hear, loud, quiet, noisy	Children may have limited vocabulary to describe sound. This may need to be taught before they complete the practical tasks. Children may think that they can only hear one sound at once. Encourage children to identify how many different sounds they can hear at once when conducting sound walks. Children may not recognise that some people cannot hear or have different levels of what they can hear.
5	**Taste** Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	Working scientifically − Performing simple tests.	In this small step, children explore taste. They look at their mouths to identify the teeth and tongue. Children understand that their tongue helps them to taste food. Children learn that there are five basic tastes – sweet, salty, bitter, sour and savoury. They should be given opportunities to sample food from each of these five tastes. Be sure to find out about and cater for any children with allergies. Children should sort and group different foods based on their dominant taste. When completing the practical activities, there are opportunities to explore how removing a dominant sense can affect other senses. For example, when sight is removed, children may find it more difficult to identify the food they are eating through smell, taste, touch or sound.	sweet, salty, sour, bitter, tasty	Children may think that the tongue has ‘zones’ that only recognise a specific taste. Taste buds that detect the five basic tastes are found throughout the mouth. Some children may not have had

					experience of each of the different types of taste. Give them the opportunity to eat foods with each of these tastes.
6	**Touch** Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	Working scientifically − Performing simple tests.	In this small step, children explore their sense of touch. They identify that touch is sensed by the skin. They understand that skin covers the human body and that touch can be sensed at any point on the body through contact with the skin. Children may want to explore and compare different textures, both inside and outside of the classroom, to help them gain a solid understanding of the key vocabulary used in this step. Children perform simple tests to investigate touch. They should be encouraged to explore touch using parts of their body other than just their hands. Children could explore how easy it is to identify an object by touching it with their feet, legs, forearms or face and compare this to using their hands. Children should 7be given the opportunity to explore a range of textures when performing tests.	skin, rough, smooth, hard, soft	Children may think that the hand is the only part of the body that can sense touch. Children may have limited vocabulary to describe touch. They may need to learn some words before they complete the practical tasks.
7	**Smell** Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	Working scientifically − Performing simple tests.	In this small step, children explore the sense of smell. They identify that the nose is used to sense smells. This step lends itself to practical activities such as smell walks or tasks to describe and identify a range of smells. As in Step 5, children should complete tasks to order, sort and group smells. For example, they can order smells in terms of their own preference from least favourite to favourite. Again, children should be given the opportunity to explore how removing more dominant senses, such as sight, can affect other senses such as smell.	nose, smell, scent, stench, sniff	Children may not recognise that there are a range of different smells. For example, smells can be pleasant or unpleasant. Introduce children to a range of smells, including those with strong odours such as garlic, onion or lavender. Children may have limited vocabulary to describe smell. They may need to

					learn some words before they complete the practical tasks.

Unit Summary	
Term	**Autumn (2 Lessons)**
Topic	**Biology: Seasonal Changes Autumn**
The Big Picture	In this unit, pupils learn about the season of Autumn. They find out that there are four seasons in a year and that in autumn, the weather gets colder**,** some trees lose their leaves**,** and the days get shorter. Children go outside to look for signs of autumn and record the weather using charts and rain gauges. They also talk about what clothes we wear in autumn and how the weather changes each day. This helps them understand how the world changes with the seasons.
Key Knowledge	• Autumn comes after summer and before winter. • In autumn, the weather gets cooler and often rainier and windier. • The hours of daylight get shorter, and nights become longer. • Some trees lose their leaves and leaves change colour.
Enquiry Question	What are the main changes in each season?
Enquiry Type	Observation over time

Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**Changes in Autumn** Observe changes across the four seasons.	Working scientifically – Asking simple questions and recognising that they can be answered in different ways.	In this block, children look at seasonal changes in autumn. They will explore changes related to the other seasons later in the year. Children should understand that there are four seasons in a year. Children should observe changes across a year and make comparisons between the seasons based on weather patterns, the hours of daylight and changes in plant and animal life. It is essential that children use their local area throughout the year to help them identify similarities and differences between the seasons. In this step, children learn that, in autumn, some trees lose their leaves, the hours of	Autumn, daylight, night, weather, season	Children may think that if the leaves fall from a tree, then the tree is dead. They should understand that it is a process that happens to some trees annually.

			daylight gradually decrease and the weather starts to become cooler. They are introduced to the enquiry question that will be revisited throughout the year. In this block, children do not need to use the terms “deciduous” and “evergreen” trees as these terms are introduced later in the year. They can observe that the leaves of some trees change colour and fall off and some do not.		
2	**Collect and record data** Observe and describe weather associated with the seasons and how day length varies.	Working scientifically – Gathering and recording data to help in answering questions.	In this small step, children collect data during autumn. They describe and record the changes in weather over a week and comment on how this affects the clothing that is appropriate for each day. They also discuss how the hours of daylight are gradually decreasing and the nights are becoming longer. As the year progresses, children should use this data to compare the similarities and differences between different seasons. It is important that children are given plenty of opportunities to do practical activities. They should use their outdoor space as much as possible to explore conditions associated with autumn.	Autumn, weather, rainfall, rain gauge	Children may have preconceptions about weather patterns in certain seasons. Allow children to record the weather over a week to challenge any misconceptions they may have. Children may find it difficult to identify that the amount of daylight changes throughout a year. Link this with the idea that it is becoming darker when they wake up and as they leave school.

Unit Summary	
Term	**Autumn (5 Lessons)**
Topic	**Chemistry: Materials**
The Big Picture	In this unit, pupils explore different types of materials such as wood, plastic, glass, metal, and rock. Children will investigate the properties of these materials, including whether they melt, freeze, float, sink, or absorb water. The unit also includes an

	investigation into transparency and opacity, teaching children to identify materials they can see through (transparent) versus those they cannot (opaque). Throughout the unit, children will develop working scientifically skills by asking questions, observing closely, performing simple tests, classifying materials, gathering and recording data, using observations to suggest answers, and communicating their findings.
Key Knowledge	• Common materials include wood, plastic, glass, metal, and rock. • Materials have different properties (e.g., hard, soft, stretchy, waterproof, transparent). • Materials are chosen for specific uses based on these properties.
Enquiry Question	Which material would be the best for a pair of curtains?
Enquiry Type	Comparative test

Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**Explore materials – wood, plastic, glass and metal** Describe the simple physical properties of a variety of everyday materials.	Working scientifically – Identifying and classifying.	In this small step, children begin to explore materials. They focus on wood, plastic, glass and metal objects and sort them into different categories, such as hard and soft. They should sort the same collection of materials in different ways and should be encouraged to come up with their own criteria when sorting objects into groups. Encourage children to find simple similarities and differences between materials. They may need support with using correct scientific vocabulary to describe different materials. Build a word bank that children can use throughout the block to address this.	Material, soft, hard, shiny, dull	Children may think that materials can only be sorted in one way. Children may focus on sorting based on the material only. Encourage children to think about other categories for sorting, such as texture, size or mass.
2	**Explore materials – rock** Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock.	Working scientifically – Observing closely, using simple equipment.	In this small step, children build on step 1 to explore rocks. This step lends itself to practical activities such as rock hunts and using simple equipment to observe rocks closely. Children are introduced to using hand lenses in this step. This skill should be modelled by an adult to teach them how to use a hand lens correctly. Children do not need to name different types of rock during this step as this vocabulary is not introduced until Year 3	Rock, heavy, light, rough, smooth	Children may think that all rocks have the same properties, such as colour or texture. Show children a range of examples of rocks to address this misconception.

					Some children may not realise that rocks can be shaped and used as a material in everyday life, such as in buildings.
3	**Objects and materials** Distinguish between an object and the material from which it is made.	Working scientifically − Identifying and classifying.	In this small step, children explore the difference between objects and the materials they are made from. It is important that children explore objects that are made from wood, plastic, glass, metal, rock and fabric. By the end of this step, children should name common objects and identify the materials they are made from. Children should have the opportunity to sort a range of objects made from the same material and the same object made from different materials, e.g., a wooden spoon and a metal spoon. In this small step, children only need to name the materials they identify and not define them.	object, material, wood, metal, plastic, glass, rock, wool	Children may not be able to tell the difference between an object and the material it is made from. Some children may think certain objects are always made from the same material, for example, all spoons are made from metal. Children may have limited vocabulary to describe objects and materials. This may need to be revised before they complete the practical tasks.
4	**Melt and freeze** Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock.	Working scientifically − Performing simple tests.	In this small step, children continue to focus on materials and explore the simple processes of melting and freezing. Children should be given the opportunity to work practically throughout this small step to observe how some materials melt and freeze. By the end of this step, they should identify that water needs to be frozen to turn to ice and ice needs to be heated up to melt. Children do not need to be introduced to the term “degrees Celsius” to describe temperature changes, as this is introduced in Year 2. Children should experience melting and freezing	Solid, liquid, melt, freeze, ice	Children may not recognise that melting and freezing are reversible changes. Children may think that water is not a material as it

			through hands-on learning. Wherever possible, link these processes to real-life examples, such as ice cream melting and ice cubes being made in a freezer.		is not solid like other materials they have explored in this block.
5	**Float or sink?** Compare and group together a variety of everyday materials on the basis of their simple physical properties.	Working scientifically – Gathering and recording data to help in answering questions.	In this small step, children explore different materials to see whether they float or sink when placed in water. Children should predict which objects will float or sink. They can then carry out a short investigation to see whether their predictions are correct. Children should test a wide range of objects made from different materials. Encourage them to identify both the object and the material it is made from. Throughout the investigation, children record data in a simple table, using ticks to indicate whether the objects float or sink. At the end of this step, children should sort the objects again and try to spot any simple patterns between the materials.	Material, heavy, light, float, sink	Children may think the larger an object is, the more likely it is to sink. Ensure children test a selection of objects of different sizes and masses to avoid this. Some children may think that objects made of the same type of material will all sink or float.
6	**Does it absorb water?** Compare and group together a variety of everyday materials on the basis of their simple physical properties.	Working scientifically – Using their observations and ideas to suggest answers to questions	In this small step, children carry out a simple comparative test to explore which materials are able to absorb water. They rank or sort materials based on whether they would be appropriate to clear up a water spillage. Before the test, it is essential that children have a clear understanding of the term “absorb”. This can be modelled by an adult using a sponge and water. By the end of this step, children should understand that some materials absorb water and some do not. They should use observations to identify which material has absorbed the most water and the least water. Use a pipette to measure the amount of water for each material. This will be the first-time children have used a pipette, so they will need to practise this before carrying out the experiment. Children will not yet have been introduced to millilitres in maths. Make a visual mark on the pipette so they can clearly see that the same amount of water is being used each time.	Absorb, independent, dependent, controlled variables	Children may think that if the water is absorbed by the material, then it has disappeared. Show them that the water can be removed by squeezing the absorbent material
7	**Investigate materials** Compare and group together a variety of everyday materials on the basis of their	Working scientifically – Using their observations and ideas to suggest answers to questions.	In this small step, children carry out a comparative test to explore the best material for curtains. They should identify that curtains need to be easily opened and closed without losing their shape and should let only a small amount of light pass through. Children perform simple tests on a range of materials before identifying the most suitable material. In this investigation, children are introduced to	transparent, opaque, independent, dependent, controlled variables	Children may not understand the hazards of using torches. They need to be taught how to safely use this piece of

	simple physical properties.		the terms “transparent” and “opaque”. The term “translucent” should not be used in this step as it is introduced in Year 2. Children use torches to explore how much light passes through a material. Experiment variables are identified for adults. Children do not need to use these terms at this stage. However, children should be able to identify what they will change and keep the same when carrying out an experiment. This should be discussed as a whole group before they begin the experiment.		equipment and should be aware that it can damage the eyes if shone directly into them.

Unit Summary	
Term	**Autumn (2 Lessons)**
Topic	**Biology: Seasonal Changes**
The Big Picture	In this unit, pupils focus on Winter and how it compares to other seasons. Key learning includes observing that winter has fewer hours of daylight and longer nights. The unit also emphasizes collecting and recording weather data in winter and comparing it to autumn data, using tools like a rain gauge, to understand seasonal differences in weather patterns.
Key Knowledge	• There are four seasons in a year: spring, summer, autumn, and winter. • In winter, there are fewer hours of daylight than at other times of the year, and the nights are longer.
Enquiry Question	What are the main changes in each season?
Enquiry Type	Observation over time

Intended Learning

Lesson	**Learning Objective / National Curriculum link.**	**Skill Objective**	**Brief Overview**	**Key Vocabulary**	**Things to look out for**
1	**Changes in winter** Observe changes across the four seasons.	Working scientifically – Asking simple questions and recognising that they can be answered in different ways.	In this block, children look at seasonal changes in winter. Children should remember that there are four seasons in a year: spring, summer, autumn and winter. Children focus on one season in each block and observe changes across a year. They should make comparisons between the seasons based on weather conditions, the number of hours of daylight and changes in plant and animal life. It is essential that children use their local area throughout the year to help them to identify similarities and differences between the seasons. In this step, children learn that, in winter, the weather is colder than during the rest of the	Winter, daylight, weather, night, season	Children may think that all plants and trees are dead during winter. Children may think it always snows in winter.

			year, there are fewer hours of daylight. Children can observe that some trees have no leaves in winter and some trees have kept their green leaves. They do not need to use the terms “deciduous” and “evergreen” as these terms are introduced in the Plants block later in the year.		
2	**Collect and record data** Observe and describe weather associated with the seasons and how day length varies.	Working scientifically – Gathering and recording data to help in answering questions.	In this small step, children collect data during winter. They describe and record the weather over a week and comment on how the conditions might influence what clothes people choose to wear each day. They discuss how there are fewer hours of daylight in winter than during the rest of the year and how the nights are longer. Earlier in the autumn term, children collected and recorded data in autumn. Once they have collected data during winter, they can look at the similarities and differences between the two seasons. Children should use the space outdoors as much as possible during this block to make it easier for them to understand and compare seasonal differences between autumn and winter.	rainy, snowy, windy, cloudy, frosty, sunny	Children may have preconceptions about weather conditions in certain seasons. Allow children to record the weather over a week to challenge any misconceptions they may have. Children may find it difficult to identify that the hours of daylight changes throughout a year. Draw their attention to the way it gradually becomes darker and then lighter again when they leave school and when they wake up.

Unit Summary	
Term	**Spring (1 Lesson)**
Topic	**Biology: Planting A**
The Big Picture	In this unit, pupils are introduced to plant growth and the basic structure of common flowering plants, including trees. Children will engage in an observation-over-time enquiry, planting seeds indoors due to the colder winter months, and observing their growth. They will identify and name parts of plants like roots, stems, leaves, and flowers, and learn that plants are living things that typically grow from seeds in soil.
Key Knowledge	• A plant is a living thing that usually grows in soil. • Some plants have roots, a stem, leaves, and flowers. • A seed can be planted to grow into a new plant. • Some seeds can be planted in winter but must be kept warm to grow.
Enquiry Question	How do the things I plant change over time?
Enquiry Type	Observation over time

Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**Plant – Winter** Identify and describe the basic structure of a variety of common flowering plants, including trees.	Working scientifically – Asking simple questions and recognising that they can be answered in different ways.	In this small step, children explore plant growth. They begin an observation over time enquiry to explore how the things they have planted change throughout the year. In this block, children plant seeds and observe any changes in growth over the rest of the term. Due to the time of year, they will need to grow plants inside the classroom before transferring them outside and replanting when it is warmer. By the end of this step, children should understand that although some plants can grow in colder months, they need to be kept in a warmer temperature, such as the classroom, in order to grow. They do not need to use the word “temperature” as this concept is introduced in Year 2. However, they can observe that it is warmer in the classroom than it is outside. Within this step, children identify and name the basic parts of a plant to help them use correct terminology when observing changes in their own plants.	flower, leaf, stem, root, seed, soil	Children may think that all plants die in the winter months. Explain that it is more difficult for plants to grow during winter as it is colder.

Unit Summary	
Term	**Spring (6 Lesson)**
Topic	**Biology: Animals**
The Big Picture	In this unit, pupils are introduced to different animal groups including mammals, birds, fish, amphibians, and reptiles. Children will learn to compare and group animals based on their characteristics and diet, distinguishing between carnivores (meat-eaters), herbivores (plant-eaters), and omnivores (eating both plants and animals).
Key Knowledge	• Animals can be grouped into types such as mammals, birds, fish, amphibians, and reptiles. • Animals can also be grouped by what they eat: carnivores (meat-eaters), herbivores (plant-eaters), and omnivores (eat both).
Enquiry Question	Are all animals the same?
Enquiry Type	Research

Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**Mammals** Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.	Working scientifically – Asking simple questions and recognising that they can be answered in different ways.	In this small step, children are introduced to the word “mammal” for the first time. Children learn that a mammal is an animal that has fur or hair on its body. They will build on this understanding and look at other characteristics of mammals, such as being warm-blooded and giving birth to live young, in later year groups. The main focus of this step is to look at the difference between mammals that can be kept as pets and mammals that live in the wild. Classifying humans as mammals and identifying sea mammals will be explored in Year 2. Children should be able to name a variety of common mammals and should recognise that they all have fur or hair on their body. In this small step, children begin a research enquiry to look at whether all animals are the same. Children should use secondary sources, such as picture books, images and videos, to help them form an answer to the enquiry question.	animal, mammal, fur, wild mammal, pet	Children may think, for example, that a mouse and an elephant cannot both belong to the category of mammals due to their distinct physical differences. • Children may assume all mammals can be kept as pets and not live in the wild.

2	**Birds** Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.	Working scientifically − Gathering and recording data to help in answering questions.	In this small step, children explore and identify different birds and their features. They learn that birds have wings, a beak and feathers. Children should recognise that some birds can fly and some cannot. It is important that they are shown a wide range of examples, such as flightless and swimming birds. By the end of this small step, children should be able to name a range of common birds and identify their simple features. Within this small step, children could gather and record data by completing a bird watch in the local area. This could be repeated later in the year to compare data from different seasons. With support, children could count the number of birds they see and record the data in numerals as they are not yet familiar with using tally marks.	bird, beak, wings, feathers, flippers, webbed feet	Children may think all birds can fly. Children may think fur and feathers are the same thing, as they both feel soft. Children may think all animals with wings are birds.
3	**Fish** Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.	Working scientifically – Identifying and classifying	In this small step, children explore different types of fish and their features. They learn that fish live in water, have fins to help them swim and most have scales on their bodies. They also learn that most fish breathe with gills. In Year 2, children build on this understanding to by looking at other features of fish, such as their needs for survival. Children may have limited knowledge of the names of different fish, so choose examples that they may be familiar with, such as goldfish, clownfish or sharks. Children will now be able to explore the enquiry question in greater depth as they have an understanding of mammals, birds and fish. Provide opportunities to discuss the key differences between these animals' groups and encourage children to explain, for example, why a penguin is not a fish and what group penguins belong to.	fish, fin, tail, scales, gills	Children may use the term "fish" to describe all animals that live in water. Children may think that fish do not breathe as they are underwater.
4	**Amphibians** Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.	Working scientifically − Identifying and classifying.	In this small step, children explore different amphibians and their features. This may be the first-time children are introduced to the word "amphibian". They learn that an amphibian is an animal that lives both on land and in water. Adult amphibians spend most of their life on land, usually in damp habitats. Introduce children to common amphibians such as frogs, newts and toads. Children continue to explore the enquiry question in this step and should be given opportunities to develop their ideas and thinking throughout. Children may think that amphibians are fish as they spend part of their life in water. Therefore, it is particularly important to explore the differences between these two animal groups.	Amphibian, frog, toad, newt, webbed feet	Children may think that amphibians have scales like fish. Explore the differences between fish and amphibians to address this misconception. Children may assume penguins are amphibians as they spend part of their life in water.

5	**Reptiles** Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.	Working scientifically − Using their observations and ideas to suggest answers to questions.	In this small step, children explore reptiles and their features. They learn that a reptile is an animal that has dry scales on its body. Children will build on this understanding and look at other features of reptiles in later year groups, such as being coldblooded and laying eggs. Children may be familiar with some common reptiles, such as lizards, snakes, crocodiles and turtles. By the end of this small step, children should be able to name a range of common reptiles and identify their features. Discussing different reptiles may naturally lead to discussing where they live. Some reptiles are land reptiles and some are aquatic reptiles. In this small step, children should provide an answer to the enquiry question for this block. They should be encouraged to draw on evidence from the previous small steps when forming an answer.	Reptiles, scales, lizards, crocodile, turtle	Children may think that all reptiles are small. Children may think that all reptiles live on land. Discuss examples of aquatic reptiles, such as crocodiles or turtles, to address this misconception. Children do not need to use the word “habitat” within this step.
6	**Compare and group animals** Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets).	Working scientifically − Identifying and classifying.	In this small step, children build on their knowledge from previous small steps to compare and group animals. Children should now be able to name and identify a range of mammals, birds, fish, amphibians and reptiles. Using this knowledge, children identify and group animals into categories based on their features. They compare the different features between groups of animals and also look at similarities between groups. This is a great opportunity to recap learning from the previous small steps in this block. Children should be encouraged to sort and group animals in different ways. They may initially need to be given predetermined categories for sorting and grouping animals. However, to extend learning allow children to choose their own ways of sorting and grouping.	Mammal, bird, reptile, fish, amphibian	Children may group animals incorrectly. Revisiting the features of different types of animals will address this. Children may think all animals that live in water are fish. Be sure to include animals such as penguins and turtles to avoid this assumption.

7	**Carnivores** Identify and name a variety of common animals that are carnivores, herbivores and omnivores.	Working scientifically − Identifying and classifying.	In this small step, children explore different carnivores and their key characteristics. This is the first-time children have been introduced to the word “carnivore”. Children should learn that in the wild, carnivores hunt and kill other animals for food. Children learn about specific characteristics commonly associated with carnivores including speed, strength and sharp teeth and claws. In this small step, children look at similarities and differences between different carnivores in terms of their characteristics. They may be familiar with some carnivores, such as lions, tigers, crocodiles and wolves. Provide opportunities to recap knowledge from previous small steps within this block by discussing what group of animals each carnivore belongs to.	Animal, carnivore, sharp teeth, teeth, wild animal, pet	Children may think that only mammals can be carnivores. Sorting carnivores into their different animal groups will address this misconception. Children may assume carnivores can only be large animals.
8	Herbivores Identify and name a variety of common animals that are carnivores, herbivores and omnivores.	Working scientifically − Identifying and classifying.	In this small step, children explore herbivores and their key features. This is the first-time children have been introduced to the word “herbivore”. In this step, children learn that herbivores are animals that eat plants. They look at similarities and differences between different herbivores, particularly how they range in size from rabbits to elephants. Unlike carnivores, which often have sharp teeth, many herbivores have flat teeth for chewing plants. Children may already know some common herbivores, such as cows, horses, sheep and rabbits. Throughout this step, provide opportunities to recap knowledge from previous small steps within this block by discussing what group of animals each herbivore belongs to.	Animal, herbivore, plant, vegetable, fruit	Children may assume large animals, such as elephants, eat other animals. Sorting animals into carnivores and herbivores will address this misconception. Children may identify animals that eat both animals and plants as herbivores. Omnivores will be explored in the next step.

9	Omnivores Identify and name a variety of common animals that are carnivores, herbivores and omnivores.	Working scientifically − Identifying and classifying.	In this small step, children are introduced to the word “omnivore” for the first time. They learn that an omnivore is an animal that eats both animals and plants. Omnivores range in size from tiny insects such as ants, to larger animals like bears. They have sharp teeth for eating other animals and flat teeth for chewing plants. Children should look at similarities and differences between different omnivores using secondary sources to support them. Children may know some common omnivores such as bears, foxes, mice and hedgehogs. As children have now learnt about carnivores, herbivores and omnivores, provide opportunities for them to group animals based on their diet, as well as their animal type.	Omnivore, herbivore, carnivore, plants	• Children may confuse the meanings of the words “carnivore”, “herbivore” and “omnivore”, which can lead them to classify an animal incorrectly. Children may assume animals of the same type (for example, birds) all have the same diet.

Unit Summary	
Term	**Spring (2 Lessons)**
Topic	**Sustainability: Caring for the planet**
The Big Picture	In this unit, pupils are introduced to the concept of sustainability and the importance of looking after Earth. While not using the term "sustainability," children learn that some actions help the planet in the long term, while others can be harmful. The unit encourages children to explore their role in caring for the planet for humans, animals, and plants, and includes practical ideas like creating recycling stations.
Key Knowledge	• Everyone should take care of the Earth. • Some actions help the planet, while others can harm it. • Caring for the planet helps people, animals, and plants.
Enquiry Question	How can we care for our planet?
Enquiry Type	Sustainability
Intended Learning	

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**Why is it important to care for our planet?**	Working scientifically – Explore the world around them and raise their own questions (non-statutory).	This block is the first-time children look at the concept of sustainability. In Year 1, children do not need to use the terms “sustainable” or “sustainability”, but they should understand that if an action can be done forever or long term then it is sustainable or helpful for the planet. If it cannot, then it can be harmful for the planet or unsustainable. In this small step, children think about our planet and why it is important to care for it. They explore their role in looking after the planet to create a sustainable future for themselves and future generations. This will enable them to think about the positive impact they can have on the planet, both locally and in the wider world. For some children, this could be the first time they have really thought about their actions and the potential consequences that could occur.	Earth, planet, harmful, helpful, animal	Children may have difficulty understanding how their actions can impact the planet, as it is not immediately visible to them. Children at this age may have difficulty thinking about things in the future, as they are so young.
2	**How can we care for our planet?**	Working scientifically – Using their observations and ideas to suggest answers to questions.	In the previous step, children looked at different positive and negative actions and the consequences that they have on the planet. By the end of this step, they should understand that everyone has a responsibility to care for the planet. In this small step, children think about the things they can do to care for the planet, which includes their homes, school, local area, surrounding areas and the wider world. Secondary sources, including books and photographs, will help to support children, especially when thinking about the wider world. Children should think of simple ways to care for their local area and may want to start actions within their school to improve their area over time.	Earth, material, recycle, reuse	Children may not realise that we need to consider our whole lifestyle when caring for the planet and that it is not just one isolated action. Children may need help to understand that each small action is part of a much bigger action.

Unit Summary

Term	**Spring (2 Lessons)**
Topic	**Biology: Seasonal Changes**
The Big Picture	In this unit, pupils are taught about the characteristics of Spring and how it compares to other seasons, building on their prior learning of Autumn and Winter. Key learning includes observing that daylight hours increase and nights shorten in spring, and recognizing that plants start to grow and some trees regrow their leaves. Children will continue to collect and record weather data, making comparisons across the seasons to understand changing weather patterns.
Key Knowledge	• In spring, plants start to grow and some trees regrow their leaves. • There are more daylight hours and shorter nights in spring. • The weather in spring can change quickly.
Enquiry Question	What are the main changes in each season?
Enquiry Type	Observation over time

Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**Changes in Spring** Observe changes across the four seasons.	Working scientifically – Asking simple questions and recognising that they can be answered in different ways.	In this block, children look at seasonal changes in spring. Remind them that a year is split into four seasons – spring, summer, autumn and winter. Children have previously learnt about autumn and winter and now explore changes in spring. Encourage them to make comparisons between the seasons based on weather patterns, the amount of daylight received and changes in plant and animal life. It is essential that children use their local area throughout the year to help them identify similarities and differences between the seasons. In this step, children should identify that we start to see more daylight in spring compared to winter and the weather is generally warmer. They also make the connection between more daylight and shorter night times.	Spring, daylight, night, weather, season	Children may have preconceptions about the weather in spring. Explain to them that the weather changes often during spring and it can be quite drastically different throughout the day. Children may think that it never snows in spring.
2	**Collect and record data**	Working scientifically – Gathering and recording data to help	In this small step, children look at seasonal changes in spring. They should understand that a year is split into four seasons – spring, summer, autumn and winter. They	Rain, sleet, cloud, sun, wind, snow	Children may have preconceptions

	Observe and describe weather associated with the seasons and how day length varies.	in answering questions.	will gather and collect data during spring. Children should describe and record the changes in weather over a week. They should comment on how this may change the clothing that is appropriate for each day. They also discuss how there are more hours of daylight in spring than in winter, and the nights are becoming shorter. Earlier in the year, children gathered and recorded data in autumn and winter. Once they have gathered data during spring, they should compare similarities and differences between the three seasons. They will repeat this task during the summer term. Encourage children to make any predictions about what changes will take place between spring and summer.		about weather patterns in certain seasons. Allow them to record the weather over a week to challenge any misconceptions they may have. In particular, if there are colder days or even days with snow, draw attention to this.

Unit Summary					
Term	**Spring (2 Lessons)**				
Topic	**Biology: Planting B**				
The Big Picture	In this unit, pupils further explore plant growth, building on previous learning from "Planting A". Children will observe how seeds previously planted have changed over time and will plant new seeds specifically for outdoor growth in spring, making comparisons between plants grown indoors in winter and outdoors in warmer conditions. The unit reinforces the understanding of basic plant structure and the conditions necessary for plant growth.				
Key Knowledge	• In Spring, the warmer weather allows plants to grow well outside.				
Enquiry Question	How do the things I plant change over time?				
Enquiry Type	Observation over time				
Intended Learning					
Lesson	**Learning Objective / National Curriculum link.**	**Skill Objective**	**Brief Overview**	**Key Vocabulary**	**Things to look out for**
1	**Observe changes**	Working scientifically – Observing closely,	In this small step, children explore how the seeds they planted in the 'Planting A' block have changed over time. They should be given the opportunity to look back over	plant, flower, leaf, stem, root, seed, soil	If replanting their plant outside, children may think

	Identify and describe the basic structure of a variety of common flowering plants, including trees.	using simple equipment.	the plants' growth across the term and explain how their plants have changed. This step is an opportunity to recap the parts of a plant and encourage children to use correct vocabulary when commenting on how their plant has changed over time. Depending on the type of seed that was planted in Planting Block A, it may be appropriate for children to replant their plant outside to allow it to continue to grow and change over time. Within the next step, children will plant seeds again in spring and should compare the growth of these plants to the plants they grew in winter. Link the growth of their plants to seasonal changes as much as possible within this step, to allow children to make connections between different blocks.		that if it is taken out of its pot then it may die. Explain to children that the plant will continue to live and grow outside.
2	**Plant – spring** Identify and describe the basic structure of a variety of common flowering plants, including trees.	Working scientifically − Gathering and recording data to help in answering questions.	In this small step, children continue to explore plant growth over time by planting during spring. In the previous "seasonal changes" block, children identified that in spring the weather is becoming warmer and plant life is starting to regrow after the colder winter months. Children could plant a range of flowering plants and vegetables to see how they change over time. This step is a good opportunity to recap the learning undertaken in Block 1 where children planted seeds and observed growth in the classroom. In Year 1, they do not need to understand the germination process. However, they should understand that once a seed is planted, under the right conditions, it will grow into a plant. Again, children should regularly observe the process of plant growth to allow them to understand how plants change and grow over time.	plant, flower, leaf, stem, root, seed, soil	Children may think that all plants look the same if they have only seen pictorial representations of plants. Plant a range of seeds such as carrot, cucumber and sunflower seeds so children can compare any similarities and differences between plant growth.

Unit Summary	
Term	**Summer (7 Lessons)**
Topic	**Biology: Plants**
The Big Picture	In this unit, pupils build on previous learning about plants by focusing on identifying and describing the basic structure of a variety of common flowering plants, including trees. Children will learn to differentiate between wild and garden plants, and importantly, identify and classify deciduous trees (which lose leaves in autumn) and evergreen trees (which keep leaves all year round). The unit encourages observation of plants and trees in their local area.
Key Knowledge	• Plants are living things

	• Plants have parts like roots, stems, leaves, and flowers. • Plants can be wild (grow naturally) or garden (planted by humans). • Trees can be evergreen (keep leaves all year) or deciduous (lose leaves in autumn).				
Enquiry Question	How can we sort plants into different groups?				
Enquiry Type	Identifying, grouping and classifying				
Intended Learning					
Lesson	**Learning Objective / National Curriculum link.**	**Skill Objective**	**Brief Overview**	**Key Vocabulary**	**Things to look out for**
1	**Plant parts** Identify and describe the basic structure of a variety of common flowering plants, including trees.	Working scientifically – Identifying and classifying.	In Reception, or at home, children may have observed and made drawings of plants. In this small step, children name and identify the roots, stem, leaves and flowers, including the petals, of a flowering plant. Children are not required to learn the functions of each plant part, as these are covered in Year 3 Within this step, children perform a simple plant dissection, using classroom scissors. Children should be exposed to a range of different plants that have a variety of leaf shapes and flowers. Through grouping and classifying the plant parts, children should be encouraged to make generalisations and spot simple patterns between them. Children will explore the parts of a tree in the next step.	Flower, petals, leaf, stem, roots	Children may make incorrect generalisations, for example that all flowers are yellow. Show them a variety of plants to address this. Children may not understand that most roots grow underground. Show them a plant growing in soil. Pull a plant from the soil to allow children to see the roots that have grown underneath the soil.
2	**Tree parts** Identify and describe the basic structure of a variety of common flowering plants, including trees.	Working scientifically – Identifying and classifying.	In this step, children identify and name tree parts. They should identify the roots, trunk, branches, leaves and fruit. Children discussed trees in the Seasonal changes blocks, but they may not have named the specific parts of trees. Ensure that they see a variety of different trees, either in images or living. They should identify key similarities and differences between the trees. Encourage them to compare trees and other plants. Ensure that children are aware that trees are plants. In this step, children should explore the enquiry question, with the addition of trees.	Leaf, branch, trunk, roots, fruit	Children may think that plants are small and trees are tall. Show them a range of trees to address this misconception.

			They are completing an identifying, grouping and classifying enquiry. Children do not need to use the words “deciduous” and “evergreen” yet because these terms are introduced later in the block.		Children may think that trees die in winter. It may be necessary to recap the seasonal changes referencing the appearance of trees.
3	**Wild and garden plants** Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.	Working scientifically – Observing closely, using simple equipment.	In this small step, children name and identify common wildflowers and garden plants. They identify that wildflower are plants that grow naturally in the countryside, such as bluebells, buttercups, daisies, dandelions and nettles. Garden plants, such as sunflowers and roses, are planted in a garden by humans and looked after by them. Children have already grouped plants based on a range of categories, such as size and appearance. In this small step, they group plants based on whether they are wild or garden plants. By the end of this step, children should recall the names of some common wild and garden plants. The use of games, quizzes or flashcards may be useful in supporting recall.	wildflower, daisy, garden plant, sunflower	Children might use colour alone to group the plants, for example buttercups and dandelions are both yellow. Give children detailed photographs or real-life examples of plants to support identification. Keep in mind that some children may be colour blind and need more support for colour grouping activities.
4	**Plants in my local area** Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.	Working scientifically – Gathering and recording data to help in answering questions.	In this small step, children use their knowledge of common garden and wildflowers to identify plants in their local area. Images of familiar plants from the previous step could be used to help them name the plants they see. Children should identify any familiar species and could count the number of plants they identify. Encourage children to use hand lenses to closely observe the plants and tell them to avoid touching or picking plants. They have already grouped plants based on whether they are wildflowers or garden plants. Children should now put real-life examples into these groups. Encourage children to create scientific drawings of observed wildflowers and garden plants and to label the parts that they identify.	Wildflower, nettle, buttercup, dandelion, garden plant	It may be useful to pre-plan the location of the area, or the route taken to get there, to ensure children can observe a variety of familiar plants from this block. Children have not used tallies for counting and

					recording. Use a small area to allow children to count and record in numerals.
5	**Deciduous trees** Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.	Working scientifically – Identifying and classifying.	In this small step, children are introduced to the term “deciduous” for the first time. There is no onus on children to read or write the word deciduous but this can be introduced verbally by the teacher. They should identify that deciduous trees lose their leaves in autumn. Encourage children to make links to previous Seasonal changes blocks when discussing deciduous trees. Ensure that children can observe a variety of common deciduous trees, in images or as living trees. These could include horse chestnut, oak and sycamore trees. It may be useful to look at the leaf structure of the different trees, focusing on their appearance.	Deciduous tree, leaf, horse chestnut, oak, sycamore	Children may make incorrect generalisations, for example, that deciduous trees have orange leaves all year round. They should see a variety of trees to help with this. Children may think that trees die in winter. Recap the seasonal changes in the appearance of trees to remind children that leaves sprout again in spring.
6	**Evergreen trees** Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.	Working scientifically – Identifying and classifying.	In this small step, the word “evergreen” is introduced to describe trees that keep their leaves all year round. Although children may have identified that some trees keep their leaves all year round in Step 2, they now use “evergreen” to describe these trees. Earlier in this block, children identified the parts of different trees, labelling the roots, trunk, branches, leaves, flowers and fruit. During this step, children explore the “needle-like” leaf structure of some evergreen trees and how these trees differ from the deciduous trees studied so far. By the end of this step, children should be able to name and identify examples evergreen trees, such as holly and pine trees.	Evergreen tree, pine, holly, branch, needles	Children may believe that any tree with green leaves is an “evergreen” tree. Children need to recognise that a tree cannot change between “evergreen” and “not evergreen”. Establish that a tree does not do this, even when its leaves change colour through the year.

7	**Trees in my local area** Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.	Working scientifically – Using their observations and ideas to suggest answers to questions.	In this step, children use their knowledge of different types of trees to identify trees in their local area. They could use images of trees from the previous steps to help them to identify the trees they see. Encourage children to use hand lenses to observe their findings closely, especially the leaves. Children should be guided towards answering the enquiry question for this block, using the findings from this step. They have already grouped images of trees based on whether the trees are deciduous or evergreen. They should now be able to group the living trees they see, explaining their rationale for doing so.	evergreen tree, deciduous tree, leaf, needles	Pre-plan which local area you visit and the route you take to get there to ensure that children can observe a variety of familiar trees from this block. Children may need to be reminded to look closely at the shape of the leaves on each tree, because many trees will have green leaves at this time of year.

Unit Summary	
Term	**Summer (2 Lessons)**
Topic	**Biology: Planting C**
The Big Picture	In this unit, pupils will observe how plants change over time and build on their knowledge from previous planting units. They will monitor the growth of plants from earlier blocks and plant fast-growing seeds, such as watercress or lettuce, directly outdoors where possible. This unit emphasizes that warmer summer weather provides ideal conditions for outdoor plant growth and reinforces pupils' understanding of seasonal changes in the natural environment.
Key Knowledge	• In summer, the weather is warmer so seeds and plants can grow outside.
Enquiry Question	How do the things I plant change over time?
Enquiry Type	Observation over time
Intended Learning	

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**Observe changes** Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.	Working scientifically – Observing closely, using simple equipment.	In this small step, children explore how the seeds they planted in spring have changed over time. Children should look at the growth of their plants, and should describe the changes in the plants from planting blocks A and B. Use this step to recap the parts of a plant, and encourage children to use correct vocabulary when describing how their plant has changed. Depending on the type of seed that was planted in spring, it may be appropriate for children to replant their plant outside to allow it to continue to grow and change over time. The weather should now be appropriate for plants to survive outside. Link the growth of their plants to seasonal changes as much as possible within this step, to allow children to make connections between different blocks.	plant, flower, leaf, stem, root, seed, soil, growth, measure	If replanting their plant outside, children may think that if the plant is taken out of its pot, then it may die. Explain to children that the plant will continue to live and grow outside.
2	**Plant – summer** Identify and describe the basic structure of a variety of common flowering plants, including trees.	Working scientifically – Gathering and recording data to help in answering questions.	In this small step, children continue to explore plant growth over time during summer. Children have already explored spring flowering plants. They could now plant a range of summer flowering plants and vegetables to see how different plants change over time. Planting fast-sprouting, edible plants would support learning in the following sustainability block. This step is a good opportunity to recap the conditions for plant growth. In Year 1, children do not need to understand the germination process, because this is introduced in later year groups. They should understand that once a seed is planted, under the right conditions, it will grow into a plant. Children should regularly observe the process of plant growth to allow them to understand how plants change and grow over time.	plant, flower, leaf, stem, root, seed, soil, growth, trowel	Children may not realise that seeds and plants can be planted outside. When planting outside, be aware that local wildlife may eat the bulbs or seeds. These can be protected using a recycled clear plastic bottle.

Unit Summary	
Term	**Summer (2 Lessons)**
Topic	**Sustainability: Cooking and growing**

The Big Picture	In this unit, pupils explore where food comes from, specifically focusing on how plants are grown for human consumption. Children will learn that many plant parts are edible and that farmers grow crops for food. The unit culminates in practical activities such as preparing and eating a simple meal using ingredients they have grown, connecting their planting experiences with the food they eat.
Key Knowledge	• Many plants have parts that humans can eat. • Crops are plants that farmers grow to be eaten. • Much of the food we eat comes from crops.
Enquiry Question	Where does my food come from?
Enquiry Type	Sustainability

Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Outcome and Overview	Key Vocabulary	Things to look out for
1	**Where does my food come from?**	Working scientifically – Asking simple questions and recognising that they can be answered in different ways.	In this small step, children look at how some plants can be grown and eaten for food. In previous planting blocks, children planted seeds and observed changes in growth over time. Children should discuss how the things they have planted have changed over time to support new learning. They could plant fast sprouting edible plants, such as cress, lettuce, spinach or chives within this block to observe this process further. Children should be introduced to farming and how fruit and vegetables can be grown on a large scale. Ensure that there are a variety of different fruit and vegetables for children to observe, in addition to those they have grown in class. These could be brought in to show children, or they could be shown images. Explain to children that farmers grow food for others, as well as for themselves.	Crops, fruit, vegetables, seed, farmer	Children may think that fruits such as tomatoes, olives and avocados are vegetables. Clarify to them that this is not the case. Children may think that their food comes from a supermarket or shop rather than how it is originally grown or produced.
2	**What have I planted and grown this year?**	Working scientifically – Using their observations and ideas to suggest answers to questions.	In this small step, children reflect on the plants they have grown this year, providing an opportunity to revisit the process of plant growth and how plants change over time. In the previous step, children were introduced to the idea that much of the food on their plate comes from crops grown by farmers. They also had an opportunity to revisit learning from previous planting steps by looking at how these plants could be used for food. By the end of this step, children will create ideas for meals using a variety of commonly grown fruit and vegetables. There are	Plant, seed, crops, cook	Children may not be aware of the ingredients within many of the meals and foods that they eat. Children may focus on the fact they do not

			opportunities for children to work practically within this step to create a simple meal from different fruit and vegetables. If possible, this could include some plants that they have grown themselves in previous blocks.		personally like to eat the food they have grown. They should be reminded that farmers grow food for others as well as for themselves.

Unit Summary	
Term	**Summer (3 Lessons)**
Topic	**Biology: Seasonal Changes**
The Big Picture	In this unit, pupils explore the characteristics of Summer, building on their understanding of other seasons. They will learn that Summer has the most daylight hours and is typically the warmest season, leading to more plant growth and a peak in animal numbers. The unit encourages continued observation and recording of weather data, allowing children to compare summer weather patterns with those of autumn, winter, and spring.
Key Knowledge	• Summer is usually the warmest season and has the most daylight hours. • In Summer, plants grow a lot, many animals have babies, and some trees have fruits and seeds.
Enquiry Question	What are the main changes in each season?
Enquiry Type	Observation over time

Intended Learning

Lesson	**Learning Objective / National Curriculum link.**	**Skill Objective**	**Brief Overview**	**Key Vocabulary**	**Things to look out for**
1	**Changes in Summer** Observe changes across the 4 seasons.	Working scientifically – Asking simple questions and recognising that they can be answered in different ways.	In this small step, children look at seasonal changes in Summer. Remind children that summer is one of the four seasons in a year. Children should use their observations of the local environment to identify the changes in Summer and compare these with the other seasons they have studied this year. By the end of this step, they	Summer, daylight, weather, night, season	Children may associate summer exclusively with the school holiday in August, often referred to as the

			should be able to observe that there is more plant growth in summer and that many animal numbers are at their peak. Children should identify that the number of hours of daylight are the greatest in summer and the average temperatures are the warmest compared to the other seasons. In Year 1, children do not need to use the term "temperature", as this is introduced in Year 2		"summer holidays". Children may have preconceptions about the weather in summer. Avoid using language that may suggest warm weather can only take place in summer, and similarly that it cannot be cold in summer. It may be necessary to explain the basic idea of seasonal trends in weather.
2	**Collect and record data** Observe and describe weather associated with the seasons and how day length varies.	Working scientifically − Gathering and recording data to help in answering questions.	In this small step, children look at seasonal changes in summer. They should understand that a year is split into four seasons – spring, summer, autumn and winter. Earlier in the year, children gathered and recorded data in autumn, winter and spring. Once children have gathered summer data, they should compare similarities and differences between the seasons. Children should describe and record the changes in weather over a week and comment on how this may change the clothing that is appropriate. They should discuss how the number of daylight hours is greater in summer than in spring and the temperatures are at their warmest. Children should be encouraged to make any predictions about what changes will take place between summer and autumn.	rainy, windy, cloudy, sunny, daylight, record, weather	Children may think that the weather is the same throughout a season. Allow children to record the weather over a week to challenge any misconceptions, for example, there are colder days as well as warm ones in summer.
3	**What are the main changes in each season?** Observe changes across the 4 seasons.	Working scientifically − Using their observations and ideas to suggest answers to questions.	In this small step, children recap weather patterns, the hours of daylight, and changes in plant and animal life for each season. Children should now compare the seasonal changes they have observed across the whole year to answer the enquiry question for this block. They should explain how each season changes from one to another with reference to their own experiences. By the end of this small step, children should be able to recall factual statements about the seasonal changes that take place every year. For example, which seasons are expected to be coldest and warmest, in which seasons the daylight	Winter, autumn, spring, summer, season	Children may think that the weather is the same throughout a season. Explain the idea of "typical" weather for a season and seasonal trends in weather.

			hours are at their greatest and fewest. To extend learning, children may also comment on which animals might be seen in each season. They should also link the changes in the seasons with their observations of the leaves on trees.		

Year 2

Autumn	Spring	Summer
Biology: Animals needs for survival Biology: Humans Chemistry: Materials Sustainability: Plastics	Biology: Plants (light and dark) Biology: Living things and their habitats Biology: Plants (light and dark)	Biology: Plant bulbs and seeds Biology: Growing up Biology: Plant bulbs and seeds Biology: Growing up Sustainability: Wildlife

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn term	Biology **Animals' needs for survival** VIEW				Biology **Humans** VIEW		Chemistry **Materials** VIEW					Sustainability **Plastic** VIEW
Spring term	Biology **Plants (light and dark)** FREE TRIAL VIEW				Biology **Living things and their habitats** VIEW						Biology **Plants (Light and dark)** VIEW	Consolidation
Summer term	Biology **Plants (bulbs and seeds)** VIEW				Biology **Growing up** VIEW		Biology **Bulbs and seeds** VIEW	Biology **Growing up** VIEW	Sustainability **Wildlife** VIEW		Consolidation	

Topic Context

Pupils start Year 2 by looking at ‘Animals and their needs for survival’. This is first in the ‘Autumn Term’ as children are more familiar with the terms: mammal, bird, fish, amphibian and reptile from Year 1. In this block, pupils also look at ‘Humans’ needs for survival’ (step 6), before exploring this concept further in the next block.

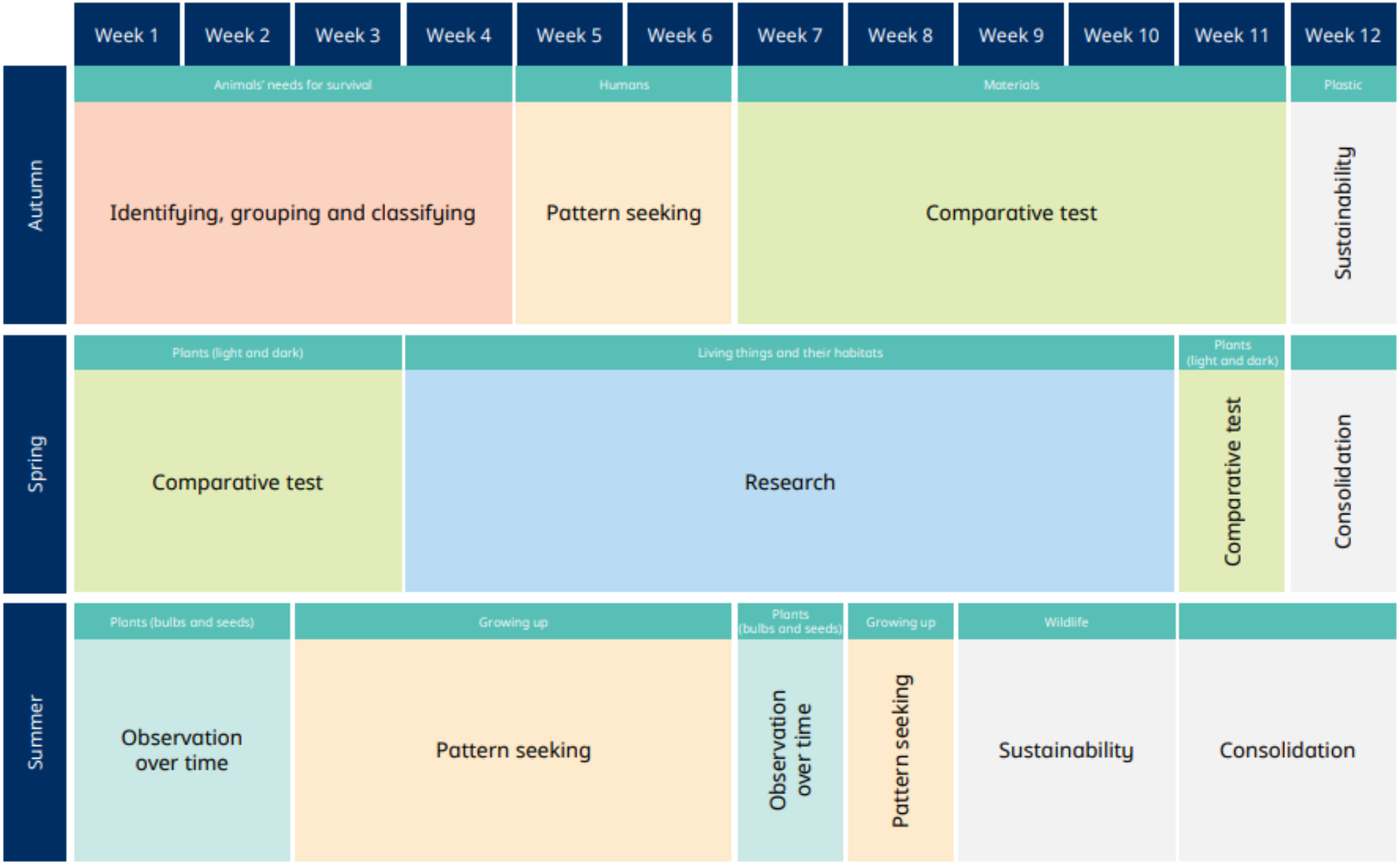
In Block 2 ‘Humans’, pupils build on this learning to look at how humans can keep themselves healthy through, diet, exercise and maintaining good overall personal hygiene.

The ‘Plants’ Block has been split over the Spring and Summer terms so that pupils can explore the conditions needed for healthy plant growth. Pupils begin by looking at how light affects plant growth (Spring Block 1) before looking at how bulbs and seeds grow (Summer Term).

In Spring Block 2, pupils use their knowledge from previous blocks to identify animals and plants in their habitats in ‘Living things and their habitats’. Pupils look at how their habitats provide everything they need to survive.

In the Summer Term, pupils learn how animals ‘Grow Up’ with a focus on parent and offspring, before looking at the simple life cycles of different animals later in the block.

Enquiry Types Mapped



Unit Summary	
Term	**Autumn (6 Lessons)**
Topic	**Biology: Animals needs for survival**
The Big Picture	In this unit, pupils learn that all animals, including humans, need air, water, food, and shelter to survive. The unit explores different animal groups—mammals, birds, fish, amphibians, reptiles, and humans—and teaches children how to classify them based on these needs rather than just physical features. Key vocabulary such as carnivore, herbivore, omnivore, and insectivore are introduced to help describe dietary requirements. Through practical, hands-on activities and scientific enquiry, children develop their understanding of survival needs while also considering how to care for animals and support sustainability in their local environment.
Key Knowledge	• All animals, including humans, need air, water, food, and shelter to stay alive. • Animals belong to different groups: mammals, birds, fish, amphibians, and reptiles. • Some animals eat meat (carnivores), some eat plants (herbivores), and some eat both (omnivores). • Animals live in different places (land, water, or both) but still need the same things to survive.
Enquiry Question	How can animals be grouped based on their needs for survival?
Enquiry Type	Identifying, grouping and classifying

Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**Mammals** Find out about and describe the basic needs of animals, including humans, for survival (water, food and air).	Working scientifically – Asking simple questions and recognising that they can be answered in different ways.	In Year 1, children identified familiar mammals and described their basic structure. In this small step, children build on their knowledge as they explore mammals' needs for survival. It is important that children are confident with what a mammal is before they think about their needs for survival. Children should know that all mammals need air, water, food and shelter to survive. In Year 2, children should use the term "air" instead of oxygen, because they will not yet have been introduced to gases. They will need to recap the terms "carnivore", "omnivore" and "herbivore" so they can differentiate between different dietary requirements. There is an opportunity for children to think about sustainability within this step. Children can explore how they can help to protect and care about mammals in their local area.	Mammals, fur, carnivore, herbivore, omnivore	Children may think that all mammals live on land. Discuss whales and dolphins to help address this misconception. Children may need support when thinking about dietary needs for different mammals.

2	**Birds** Find out about and describe the basic needs of animals, including humans, for survival (water, food and air).	Working scientifically – Gathering and recording data to help in answering questions	In this small step, children look at birds and explore their needs for survival. Children should understand that birds have the same needs as mammals. It is important that they are shown a wide range of examples of birds, including flightless and swimming birds. Children are introduced to the term “insectivore” within this step. This can be linked to the use of the terms “carnivore”, “herbivore” and “omnivore” in the previous step. Within this step, children could gather and record data by completing a bird watch in the local area. This could be repeated later in the year to compare data in different seasons. Children have not yet used tally charts so should record the data in numerals.	Bird, feathers, beak, insect, wing	When talking about the dietary requirements of birds, children may use the word “insect” to describe all minibeasts. Worms, slugs and spiders are not classified as insects. Children do not need to know this factual knowledge until Year 4, but “insect” should not be used as a general term to describe all minibeasts.
3	**Fish** Find out about and describe the basic needs of animals, including humans, for survival (water, food and air).	Working scientifically − Identifying and classifying.	In this small step, children look at fish and their specific needs for survival. They recap the basic features of fish before learning that fish need air, water, food and shelter to survive. By the end of this step, children need to be able to identify that fish have the same needs for survival as birds and mammals. This step introduces the enquiry question for this block. How can animals be grouped based on their needs for survival? Children carry out an identifying, grouping and classifying enquiry. Children record their initial ideas and think of ways to group animals based on their needs for survival. It is important that children use examples of mammals, birds and fish to identify any similarities and differences.	fish, scales, fin, gill	Children may use the term “fish” to describe all animals that live in water. Children may think that fish do not breathe because they live underwater. When grouping, children may sort animals into mammals, fish and birds rather than on their needs for survival.
4	**Amphibians** Find out about and describe the basic needs of animals,	Working scientifically − Identifying and classifying	In this small step, children identify and name common examples of amphibians before looking at their needs for survival. Children may think that amphibians are fish because they spend part of their life in water. It is important to explore the differences between these two	Amphibian, webbed feet, frog, toad, newt	Children may think that amphibians have scales or gills like fish.

	including humans, for survival (water, food and air).		animal groups. Children identify amphibians' needs for survival and compare these to other animal groups. Children continue to explore the enquiry question in this step, and should be given opportunities to develop their ideas throughout. This can be done through sorting and grouping activities. Encourage children to sort the animals based on their needs for survival rather than their physical features.		Children may need support to group animals based on their needs for survival. Provide structure to help them sort correctly. For example, "All animals need air. Sort these animals based on whether they breathe underwater or not."
5	**Reptiles** Find out about and describe the basic needs of animals, including humans, for survival (water, food and air).	Working scientifically − Identifying and classifying.	In this small step, children continue to look at the needs for survival of different animal groups. This step is focused on the needs of reptiles. Children recap knowledge from Year 1, when they identified and named some familiar reptiles and labelled some common features. By the end of this step, children should understand that reptiles need air, water, food and shelter to survive. Reptiles also need external heat to survive because they cannot generate their own body heat. This could be used as a key difference when sorting animals based on their needs for survival. Children need to discuss their answers to the enquiry question as their knowledge of animals develops.	Reptile, scales, carnivore, herbivore, omnivore	Children may think that all reptiles are small. Children may think that reptiles do not live in the United Kingdom. Continue to provide structure to support children to group animals based on their needs for survival, not their physical features.
6	**Humans** Find out about and describe the basic needs of animals, including humans, for survival (water, food and air).	Working scientifically − Using their observations and ideas to suggest answers to questions	In Year 2, children should understand that humans are mammals. In this small step, children look at humans' basic needs for survival. They should recap the features of mammals from Step 1 before applying this knowledge to categorise humans as mammals. By the end of this step, children should be able to identify humans' needs for survival. They explore the similarities and differences between humans and other animal groups. Children continue work on the enquiry question for this block and present their findings. This can be done verbally, through	Mammal, adult, baby, shelter	Children may sort and group animals based on physical features rather than their needs for survival. As a class, recap the similarities and differences between each animal group.

			simple written statements or by creating drawings and diagrams.		Children can then use this information to help them sort and group correctly. Although children are noticing differences in how animals meet their basic needs for survival, they should identify that all animals need air, water, food and shelter to survive.

Unit Summary	
Term	**Autumn (4 Lessons)**
Topic	**Biology: Humans**
The Big Picture	In this unit, pupils learn how to keep their bodies healthy through four key areas: exercise, food, hygiene, and oral health. They discover that regular exercise helps both their physical and mental health, and explore which activities increase their heart rate. Through sorting and tasting activities, they learn to identify healthy and unhealthy foods and understand the importance of a balanced diet. The unit also teaches children about personal hygiene and how germs spread, using hands-on activities to show why handwashing is important. Finally, children explore how to care for their teeth, the effects of sugar, and how to prevent tooth decay. They carry out a simple investigation to see if older children have more teeth, helping them observe patterns and think scientifically
Key Knowledge	• Exercise keeps your body and mind healthy and makes your heart stronger. • Healthy eating means eating fruit, vegetables, and not too much fat, sugar, or salt. • Hygiene means keeping clean to stop germs from spreading. • Brushing your teeth twice a day helps keep your teeth and gums healthy.
Enquiry Question	Do the oldest children have the most teeth?
Enquiry Type	Pattern Seeking

Intended Learning					
Lesson	**Learning Objective / National Curriculum link.**	**Skill Objective**	**Brief Overview**	**Key Vocabulary**	**Things to look out for**
1	**Exercise** Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	Working scientifically – Gathering and recording data to help in answering questions.	In this block, children look at how to keep healthy. This small step focuses on exercise. Children carry out a simple investigation to see whether different forms of exercise increase their heart rate. In Year 2, children do not need to find their pulse (heart rate) and count beats per minute. They can observe whether their heart rate has increased by either putting two fingers on their wrist near the thumb or using a flat palm on their chest. Before completing the investigation, children should make predictions to state which form of exercise will raise their heart rate the most and why.	Heat, physical health, mental health, exercise	Children may think that exercise has a negative effect on the body because it can leave you feeling breathless. Children may think that slower forms of exercise, such as yoga or walking, are not classified as exercise. Children may think that their heart is a “love heart” shape. Show a picture or diagram of the human heart to address this.
2	**Food** Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	Working scientifically – Identifying and classifying.	In this small step, children continue to explore how to keep healthy. They identify, name, sort and classify different foods based on a range of categories. Children identify foods that can contribute to an unhealthy diet if consumed too often. This includes foods that are high in fat, sugar or salt or provide little nutrition for the body. Children do not need to group food using the five food groups, as this concept is not introduced until Year 3 Children should be given plenty of opportunities to work practically to learn about different food types. They should be shown a wide range of food to help them understand what a healthy diet is and how to make healthy choices.	Healthy diet, unhealthy diet, meat, vegetable, fruit, sugar	Children may think eating an unhealthy diet has no impact on the body. Children may think that the food they enjoy is good for them regardless of fat or sugar content. Children may think that drinks

					have no effect on teeth or the body.
3	**Hygiene** Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	Working scientifically − Observing closely, using simple equipment.	In this small step, children explore personal hygiene. They learn about keeping clean and the reasons why personal hygiene is important. They do not need to look at oral hygiene in this step, as they look at how to keep their mouths healthy in Step 4 Children are introduced to the idea of germs through a simple practical task to help them understand that germs can be passed easily between people and surfaces if handwashing is not carried out regularly. Children should understand that some germs can cause illness. By the end of this step, children should recall ways that they can keep clean and make suggestions of what may happen if they do not maintain good personal hygiene.	Germs, hygiene, doctor, disease	Children may find the concept of germs difficult to understand as germs cannot be seen without a microscope. Use a substance to represent germs to show how easily they can be spread. Children may think that washing their hands with water alone is enough to remove germs.
4	**Teeth** Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	Working scientifically − Observing closely, using simple equipment.	In the final step of this block, children learn how to maintain good oral hygiene and the reasons why it is important. They should understand that eating too much sugar and not brushing their teeth regularly contributes to tooth decay. Within this step, children undertake a short pattern seeking enquiry to investigate whether the oldest children have the most teeth. They should think of ways to answer the enquiry question as a whole group. They should make predictions to state whether they think there will be a pattern or not. After completing the enquiry, children should identify any patterns within the data they have collected and report whether age has an impact on the number of teeth a child has.	Teeth, plaque, gums, filling	Children may not be able to count the number of teeth they have. They may find it helpful to work in pairs to do this. Children may think that their teeth only fall out if they are decaying. Baby teeth fall out naturally and are replaced with adult teeth.

Unit Summary	
Term	**Autumn (10 Lessons)**

Topic	**Chemistry: Materials**
The Big Picture	In this unit, pupils explore and compare a wide variety of everyday materials, such as wood, metal, plastic, glass, fabric, rock, and brick. They learn to identify whether materials are natural, human-made, or recyclable, and investigate their properties through hands-on activities. Children test how materials can change shape by bending, squashing, twisting, and stretching, and they discuss which materials are most suitable for different uses. A key part of the unit involves planning and carrying out a waterproof experiment to determine the best material for an umbrella, helping children develop their scientific enquiry skills. The unit also introduces sustainability by encouraging children to think about reusing and recycling materials.
Key Knowledge	• Materials are what things are made from, like wood, metal, plastic, and glass. • Some materials are natural (like wood and wool) and some are human-made (like plastic and brick). • Materials have different properties, such as hard, soft, bendy, or waterproof. • Some materials can change shape by bending, squashing, twisting, or stretching. • Recycling and reusing materials helps take care of the environment.
Enquiry Question	Which material would be the best for an umbrella?
Enquiry Type	Comparative test

Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**Explore materials** Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.	Working scientifically – Identifying and classifying.	In Year 1, children explored a range of familiar materials and carried out simple tests to explore floating, sinking, melting and absorbency, as well as transparent and opaque materials. In this small step, children build on this knowledge to identify, group and sort materials. Children identify objects that are made from natural, humanmade and recyclable materials. They should be encouraged to sort and group the same materials in more than one way. This step allows children to think sustainably about different materials. They should discuss why it is important to reuse and recycle materials. This will be built upon in the later “Plastic” sustainability block.	Materials, natural material, human-made material, recycle	Children may think that the term “material” is only used for objects inside the classroom such as toys or equipment. Allow children to identify materials outside in their local area to address this misconception. Children may think that all materials are human-made. Show examples of common natural

					materials such as wood, wool and sand.
2	**Wood, paper and cardboard** Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.	Working scientifically − Performing simple tests.	In this small step, children look at the materials wood, paper and cardboard in greater detail. They learn that paper and cardboard are made from wood. Children perform simple tests on each material to learn more about their structure and properties. They should try to change the shape of the material through folding, tearing and squashing. To extend learning, children could suggest other ways to test the materials. After children have carried out these tests, they should identify the simple properties of each material and discuss their suitability for a range of uses. It is important that they identify when a material is suitable as well as unsuitable for a purpose.	Material, smooth, rough, flexible, rigid	Children may think that all paper has the same thickness and texture. Provide a wide range of different paper and card for children to test, such as tracing paper, sugar paper and cardboard. Children may think that all wooden objects are heavy.
3	**Brick and rock** Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.	Working scientifically − Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them (non-statutory).	In this small step, children look at the materials brick and rock. Children learn that rocks are a natural material found on and underneath the Earth's surface and that brick is a man-made building material. They should be introduced to the terms "rock", "pebble" and "stone" when describing rocks. In this step, children do not need to identify and name rocks, as this is covered within the Year 3 curriculum. Children should simply differentiate between objects and buildings made from brick and rock. This step has strong links to traditional stories and tales of building houses using different materials. Children could use these stories as the basis of their explanations around suitability.	rock, stone, pebble, material	Children may think that all rocks are heavy. Children may think that all rocks are hard and cannot be broken easily. Children may think that rocks and stones are different materials. Explain to children that stone is a word used to describe smaller rocks.
4	**Glass and plastic** Identify and compare the suitability of a variety of everyday	Working scientifically − Asking simple questions and recognising that they	In this small step, children explore the simple properties of glass and plastic and use this information to discuss the suitability of using these materials for different objects. They look at the use of glass and plastic in everyday life and identify similarities and differences between the two	Brittle, flexible, transparent, translucent, opaque	Children may think that glass and plastic are the same material as

	materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.	can be answered in different ways	materials. Children use the terms “transparent”, “translucent” and “opaque” to describe materials. There are opportunities for children to think about sustainability within this step, as they can look at how glass and some plastic can be recycled. Children perform simple tests on glass and plastic to determine the differences between the two materials. If glass is used within the classroom, it is important that it is managed safely. Glass objects such as beads or marbles could be used.		they have a lot of similar properties. Children may think all plastic is hard.
5	**Metal** Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.	Working scientifically − Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them (non-statutory).	In this small step, children focus on metals. They explore a range of metallic objects and perform simple tests to further understand the properties of metals. Children learn that there are different types of metal that are suitable for different uses. They do not need to test whether metals are magnetic, as they explore this concept in Year 3 By the end of this step, children should be able to identify when metal would be a suitable material for an object and explain why. They should also discuss when metal would be unsuitable for use. For example, they may state that aluminium foil is not a suitable material to make a set of keys from.	Hard, flexible, rigid, shiny, dull	Children may think that all metals are silver in colour. An easy way to avoid this misconception is to allow children to explore different coins. Children could identify the different coins and sort them into groups. Children may think that all metals are rigid. Aluminium foil is a familiar material that can be used to show children that some metals can change shape easily. Children may think that all metals are heavy.
6	**Fabrics** Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic,	Working scientifically − Observing closely, using simple equipment.	In this small step, children focus on fabrics. In Year 1, they explored texture and felt a range of fabrics with different parts of their body. In this step, they identify and name a range of natural and man-made fabrics and understand that they all have different properties and uses. Children can perform simple tests to determine which fabric would be most suitable for different purposes.	Fabric, flexible, lightweight, tough	Children may think that fabrics are not materials. Children may think that natural fabrics, such as

	glass, brick, rock, paper and cardboard for particular uses.		For example, they could test which material would be the most suitable for a superhero costume or a PE kit. In this small step, children should not test how waterproof a fabric is, as they complete a comparative test in steps 9 and 10 of this block to explore this concept.		wool and cotton, are not fabrics. Create a quick quiz to recap objects/items and where the material comes from. For example, a woollen jumper is made from the wool of a sheep.
7	**Same object, different material** Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.	Working scientifically − Using their observations and ideas to suggest answers to questions	In this small step, children explore how objects can be made from different materials depending on their usage. Children explore real-life examples and discuss why a material is suitable for a particular purpose. They also identify when a material would be unsuitable for a purpose and give simple reasons why. Children could design an object from different materials and explain the advantages of the materials they have chosen. They should be encouraged to use appropriate vocabulary when explaining why a material is suitable or not suitable for a purpose. There are opportunities to think about sustainability within this step. Children could think of reasons why some materials have a negative impact on the planet. They may want to explore the differences between a single-use plastic water bottle and a bottle made from a harder, reusable plastic.	Tough, brittle, hard, soft, flexible	Children may think that objects can only be made from one material. Show them three water bottles – plastic, glass and metal. Discuss the similarities and differences between the bottles.
8	**Test materials – bend, squash, twist and stretch** Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	Working scientifically − Performing simple tests.	In this small step, children carry out simple tests to discover whether they can change the shape of a solid material through bending, squashing, twisting and stretching. Children should use simple tables to record data from their investigations. By the end of this step, children should understand that some solid materials can change shape if a force acts upon them and some cannot change shape. Children do not need to understand why the materials they are testing are classified as solid materials, as this concept is covered in Year 4	Bend, squash, twist, stretch	Children may think that all solid materials are hard. Children may think that all solid materials are heavy. Children may think that no solid materials will change shape if a force acts on them.

					Children may think that if a solid material changes shape, it cannot change back to its original shape.
9	**Plan – waterproof experiment** Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.	Working scientifically − Asking simple questions and recognising that they can be answered in different ways.	In this small step, children plan a comparative test to identify which material would be the most suitable for an umbrella. Before completing the experiment, they should discuss that the material for an umbrella needs to be waterproof, lightweight and strong. They should predict which material they think will be best and give reasons for their prediction. Within this step, children should learn how to use the experiment equipment correctly. They will have had little practice using a pipette, so this skill will need to be modelled and practised. Experiment variables are identified for adults. Children do not need to use these terms at this stage, but they should be able to identify what they will change and what they will keep the same when carrying out the experiment.	Independent variable, dependant variable, controlled variable	Children have not yet been introduced to measuring in millilitres in maths. They can use the increments on the pipette to ensure they drop the same amount onto each material. For example, they may choose to measure the water up to the fifth line but they do not need to use the term “5 millilitres”.
10	**Investigate – waterproof experiment** Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.	Working scientifically − Using their observations and ideas to suggest answers to questions.	In this small step, children carry out a comparative test to explore which material would be the best for an umbrella. They recap that an umbrella needs to be lightweight, waterproof and strong. Children could carry out simple tests including pulling, twisting or tearing the material to test its strength before testing to see if it is waterproof. If the material breaks during this testing, it will need to be replaced before testing to see whether it is waterproof. Children should recap the experiment variables they identified in the previous step. They do not need to use the terms “independent”, “dependent” and “controlled variables” but should explain what they are changing and keeping the same.	Waterproof, lightweight, strong, breakable	Children may need to recap how to use a pipette correctly. Children should practise this skill before they conduct the experiment. Children may need support when ranking materials from least to most suitable. They should refer to the material properties of an

					umbrella to support their findings.

Unit Summary	
Term	**Autumn (2 Lessons)**
Topic	**Sustainability: Plastic**
The Big Picture	In this unit, pupils learn that plastic can be both helpful and harmful. They explore how plastic is used in everyday life and understand the difference between single-use and reusable plastics. The unit highlights the negative effects of plastic waste on humans, animals, and the environment, while also showing that some plastics can be recycled. Through practical activities like sorting plastics, creating reusable items, and suggesting ways to reduce plastic waste at school, children develop a strong sense of environmental responsibility. By the end of the unit, they understand why reducing plastic use and recycling are important for protecting the planet.
Key Knowledge	• Plastic is a man-made material used for many things. • Some plastics are helpful, but others can harm people, animals, and the planet. • Single-use plastic is used once and then thrown away. • Some plastics can be recycled, but not all. • We can help by reducing, reusing, and recycling plastic.
Enquiry Question	How is plastic helpful and harmful?
Enquiry Type	Sustainability

Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**How is plastic helpful and harmful?**	Working scientifically – Explore the world around them and raise their own questions (non-statutory).	In the previous materials block, children learnt that plastic is a human-made material and some plastics can be recycled. In this small step, they look at how plastic is both helpful and harmful. Children learn that the overuse of single-use plastic has had negative impacts on humans and other animals all over the world. Children should understand the basic positive and negative impacts of	Plastic, human-made material, recycle, single-use plastic	Children may think that throwing recyclable plastic in the refuse bin has no impact on the planet. Discuss the

			plastic and should be able to suggest simple ways they can reduce their plastic waste in school. Throughout this sustainability block, there are opportunities for children to work scientifically and practically to think of ways of reducing plastic waste. If children are shown images of how plastic has a negative impact on humans and other animals, ensure that these images are age-appropriate.		differences between recyclable and non-recyclable plastic to address this.
2	**How can we reduce our plastic waste in school?**	Working scientifically – Using their observations and ideas to suggest answers to questions.	In this small step, children build on their understanding of plastic and look at how they can reduce plastic waste in school. This step gives children the opportunity to work scientifically and practically to think of ways to reuse and recycle plastic items, rather than send them to landfill. By the end of this sustainability block, children should understand that plastic is both helpful and harmful. They should know that some plastics are recyclable and that there are ways to reduce plastic waste at home and in school. Children should be given the opportunity to suggest small changes within their school setting to reduce plastic waste. They should understand why reducing plastic waste has positive impacts for humans and other animals.	Plastic, human-made material, recycle, single-use plastic	Children may think that their plastic waste has no impact on the planet. Children may think that once a plastic item has been used it cannot be used again. Show children a used and washed yoghurt pot. Ask them to think of ways this yoghurt pot could be used again in school.

Unit Summary	
Term	**Spring (5 Lessons)**
Topic	**Biology: Plants (light and dark)**
The Big Picture	In this unit, pupils explore a wide variety of plants, including fruits, vegetables, herbs, and trees. They learn to identify and name key plant parts such as roots, stems, leaves, flowers, and branches. The unit focuses on what plants need to grow and stay healthy, with a particular emphasis on water and light. Children plan and carry out a simple investigation to compare how plants grow in light versus dark conditions, helping them understand that light is essential for healthy plant growth. Throughout the unit, children develop scientific skills like observing closely, asking questions, making predictions, and recording findings
Key Knowledge	• Plants are living things that grow in soil and need water and light to be healthy. • Plants have parts like roots, stems, leaves, flowers, and fruit. • Trees are also plants and can have trunks, branches, and blossoms.

	• Plants grow better in the light than in the dark.
Enquiry Question	Do plants grow healthier in the light or dark?
Enquiry Type	Comparative test

Intended Learning					
Lesson	**Learning Objective / National Curriculum link.**	**Skill Objective**	**Brief Overview**	**Key Vocabulary**	**Things to look out for**
1	**Explore plants** Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	Working scientifically – Observing closely, using simple equipment	In this small step, children have the opportunity to explore a wide range of plants. They should closely observe a diverse selection of plants, which can include flowering plants, fruit, vegetables and herbs. They should sort and group these plants using different criteria or categories. For example, they could group plants based on their colour, smell or other physical features. It is important to note that depending on the local area, children may not have access to a wide variety of growing plants. However, teachers can bring plants into the classroom to ensure that children can still sort and group them in different ways. This step also recaps Year 1 content, where children learnt to identify and name familiar flowering plants and trees.	Plants, flower, fruit, vegetable, herb	Children may have preconceived ideas about what a plant is. They may not classify fruit, vegetables or herbs as plants. Show children images of these plants so they can see how these parts of a plant grow. Children may think that trees are not classified as plants.
2	**Plant parts** Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	Working scientifically – Observing closely, using simple equipment.	In this small step, children name and identify the parts of common plants and trees. In Year 1, children named and identified the simple parts of flowering plants and spotted some simple patterns between plant parts including colours, sizes and shapes. Within this step, children recap the parts of flowering plants and trees and identify similarities and differences between plant parts. In Year 2, children do not need to identify the function of each plant part as this concept is introduced in Year 3 It is important that children identify the parts of a tree within this step so they understand that trees are also plants. Show children a range of deciduous and evergreen trees when naming the parts.	Blossom, leaf, stem, trunk, branch	Children may need to recap the terms “deciduous” and “evergreen” from Year 1 to understand that some trees lose their leaves during autumn and winter and some keep their leaves. Children may have preconceived

					ideas about fruit based on the fruit they eat regularly.
3	**What do plants need to grow?** Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	Working scientifically − Asking simple questions and recognising that they can be answered in different ways.	In this small step, children explore the conditions plants need in order to grow. The national curriculum states that children should identify that plants need water, light and to be kept at the correct temperature in order to grow and stay healthy. Within this step, children focus on how plants need water and light to grow. They will look at temperature within the summer plant block. Children look at the best conditions for growth for seeds. They should be given the opportunity to observe the seeds in detail and make accurate observations using hand lenses. Within this step, children should understand that some plants grow from seeds and that seeds need water and the correct conditions to grow. Children do not need to understand the germination process in this step, as this is covered in Year 3. This step introduces the enquiry question for this block.	Seed, plant, sunlight	Children may think that all seeds grow into the same plants. Show children some examples of different seeds and pictures of the plants they grow into. Children may think that the seed consumes the soil to begin it's life cycle.
4	**Plan – light and dark** Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	Working scientifically − Asking simple questions and recognising that they can be answered in different ways.	In this small step, children plan a comparative test to explore whether plants grow healthier in light or darkness. During this investigation, they will plant seeds and provide one plant pot with access to sunlight, while the other should be kept in the dark. Children should make regular observations of the plants' growth throughout the term to make comparisons. To maintain consistency, both plants should be kept indoors at the same temperature. At this stage, children do not need to specifically measure or control the temperature, as this is addressed in the summer term. In this step, children plan their investigation and determine what they will change and keep the same. They should also create a schedule for observations to ensure both plants are regularly monitored for any changes.	Independent variable, dependant variable, controlled variable	Children may think that plants do not need any light at all to grow. Children may think that all plants need the same amount of light. This is not the case, as some need strong, direct sunlight while others do not.
5	**Investigate – light and dark** Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	Working scientifically − Performing simple tests.	In this small step, children carry out a comparative test to explore whether plants grow healthier in the light or dark. Children should work in small groups and each group should be given two pots for planting. One pot should be placed in a well-lit area, where it has access to sunlight, while the other pot should be kept in a dark area, with minimal exposure to light. Children plant their seeds in each pot, ensuring that they are given equal amounts of soil and water. Throughout the experiment, children should regularly observe their plants to ensure that they are noting down any changes between the two plant pots.	Seed, plant, soil, sunlight, compost	Children may think that plant growth will happen over a short period of time, such as overnight. Explain to them that plant growth can take days or weeks before any

			They should make careful observations and measurements, noting down any changes they observe over time. They will make conclusions in the second “light and dark” block later in the term.		changes above the surface of the soil are visible. Ensure that the seeds are not overwatered as this will affect plant growth.

Unit Summary	
Term	**Spring (10 Lessons)**
Topic	**Biology: Living things and their habitats**
The Big Picture	In this unit, pupils learn that all living things need specific habitats to survive. They explore a range of habitats including woodlands, oceans, deserts, polar regions, and microhabitats, discovering how plants and animals are suited to these environments. The unit teaches that habitats provide food, water, and shelter, and helps children understand how animals can be grouped by their diets as carnivores, herbivores, or omnivores. Children also learn how to build simple food chains to show how living things depend on one another. Finally, they learn to classify things as living, dead, or never alive. Throughout the unit, children develop scientific skills such as observing closely, classifying, and recording data.
Key Knowledge	• A habitat is where a plant or animal lives and gets what it needs to survive. • Different plants and animals live in different habitats like woodlands, oceans, and deserts. • Animals can be carnivores**,** herbivores**,** or omnivores depending on what they eat. • A food chain shows how living things get energy from plants and other animals. • Things can be living**,** dead**,** or never alive**.**
Enquiry Question	What different habitats are there on planet Earth and what lives in each habitat?
Enquiry Type	Research

Intended Learning

Lesson	**Learning Objective / National Curriculum link.**	**Skill Objective**	**Brief Overview**	**Key Vocabulary**	**Things to look out for**
1	**Habitats in my local area**	Working scientifically − Gathering and	In this small step, children are introduced to the concept of a habitat. It is important that children understand that	Mammal, bird, deciduous tree,	Children may think that it is only animals

	Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other.	recording data to help in answering questions.	both plants and animals have a habitat and they should be able to name some familiar habitats in their local area. In Autumn Block 1, children looked at what animals need to survive. In this block, they build on this understanding to learn that all animals are dependent on their habitats for survival. In this step, children should investigate a habitat in their local area and collect data about the different plants and animals that live there. They could repeat this at a different time of year to compare the data and identify similarities and differences. They do not need to identify microhabitats in this step as this is covered later in the block. By the end of this step, children should be able to identify that a habitat provides a plant or animal with everything that is essential for life. Children should be introduced to the enquiry question in this step. They are completing a research enquiry. What different habitats are there on planet Earth and what lives in each habitat?	evergreen tree, habitat	that have a habitat. Explain to children that plants also have a habitat which provides everything they need to survive.
2	**Polar habitats** Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other.	Working scientifically − Using their observations and ideas to suggest answers to questions.	In this small step, children look at animals and plants that live in polar habitats. This includes the Arctic and Antarctica. They should be able to identify some animals and plants that are able to survive in these extreme conditions. Children should be aware that polar temperatures can become extremely cold in the winter and only certain animals and plants can survive there. Children should explore simple reasons why polar animals can survive in such extreme temperatures. This can include layers of blubber or fat and thick fur to keep them warm during colder months. Children should understand that polar animals get everything they need to survive from their habitat. In this step, children continue to form answers to the enquiry question and should use simple secondary sources to identify a range of plants and animals in different habitats.	Carnivore, herbivore, Artic plants, habitat, hibernate	Children may think that it is only animals that have a habitat. Explain to children that plants also have a habitat which provides everything they need to survive.
3	**Desert habitats** Identify and name a variety of plants and animals in their habitats, including microhabitats.	Working scientifically − Using their observations and ideas to suggest answers to questions.	In this small step, children explore animals and plants that survive in the desert. Children should compare the differences between polar and desert animals and identify any differences between the animals that live in these habitats. This step is an opportunity to recap the five different animal groups they have been introduced to in previous blocks. Children also explore how plants survive in desert habitats with a focus on familiar plants, such as cacti. They should start to form simple explanations about how plants survive in the desert and discuss why some plants can survive for a long time	Reptile, cactus, desert, rainfall	Children may think that it is always hot in the desert. Explain that at night, the desert can be extremely cold too. Children may think that no plants and animals can survive in the desert due to the

			without needing to take in water. Throughout this step, children should continue to answer the enquiry question and should use a range of secondary sources such as text, pictures and videos to help them form an answer.		heat and lack of water.
4	**Ocean habitats** Identify and name a variety of plants and animals in their habitats, including microhabitats.	Working scientifically − Identifying and classifying.	In this small step, children explore the habitats of ocean animals. They should be able to name some familiar animals and plants in oceans and seas. Children do not need to name different species of ocean plants but should be aware that some plants grow in underwater habitats. Children should understand that ocean plants provide some animals with their dietary needs. They are also used for shelter or safety from larger predators. Children should be able to identify why these animals and plants are best suited to ocean habitats and give simple explanations of how they rely on each other to survive. Throughout this step, children should continue to think about the enquiry question for this block and should use a range of secondary sources such as text, pictures and videos to help them form an answer.	Ocean, fish, mammal, seagrass, habitat	Children may think that all animals in the sea are fish. This step is a good opportunity to recap learning from previous blocks to identify fish and other animals that live in seas and oceans, such as mammals.
5	**Woodland habitats** Identify and name a variety of plants and animals in their habitats, including microhabitats.	Working scientifically − Identifying and classifying.	In this small step, children identify animals and plants that live in woodland habitats. This step is a great opportunity to visit a local woodland, if possible, to allow children to identify plants and animals in their natural habitat. Children should be able to identify why these animals and plants are best suited to woodland habitats and give simple explanations of how they rely on each other to survive. Throughout this step, children should continue to think about the enquiry question for this block and should use a range of secondary sources, such as text, pictures and videos, to help them form an answer.	Woodland, fern, mammal, bird, moss	Children may think that a particular animal only has one habitat. For example, a fox can be found in a woodland habitat but it can also inhabit an urban area. Children may think that it is only animals that have a habitat. Explain to children that plants also have a habitat which provides everything they need to survive.
6	**Microhabitats** Identify and name a variety of plants and animals in their habitats, including microhabitats.	Working scientifically − Observing closely, using simple equipment.	In previous steps, children looked at a range of different habitats. In this small step, they explore microhabitats. It is important for children to grasp the concept that a habitat is the place where a plant or animal lives, and a microhabitat refers to an extremely small habitat. For example, a woodlouse lives beneath stones, logs or leaf litter. They should explore a variety of microhabitats and identify the animals and plants that inhabit them. Children should also realise that smaller creatures are	Microhabitat, insect, spider, snail, habitat	Children may think microhabitats do not occur in other areas, e.g., in woodlands. Children may think that all animals live in the same microhabitats.

			more likely to thrive in microhabitats and consider which animals or plants are unlikely to be found in such tiny environments. Children should be encouraged to explore and observe microhabitats in their local area without disturbing them. The enquiry question should be revisited during this small step and children could compare microhabitats to other habitats.		
7	**Habitats and diet** Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other.	Working scientifically − Gathering and recording data to help in answering questions.	In this small step, children explore habitats and diet. Children should be aware that animals have different diets and this can be used to group animals into different categories. In Year 1, children were introduced to the terms “carnivore”, “herbivore” and “omnivore”. They will consolidate this knowledge and develop it further by comparing different types of animals and their habitats. Children should consider the habitats different animals live in and think about how this will affect their diets. They should be encouraged to use their knowledge from previous small steps to think about the animals and plants that live in certain habitats and how this will form different animals’ diets. This will be built on further when looking at food chains in the next small step.	Carnivore, herbivore, omnivore, habitat, diet	Children may confuse carnivores, herbivores and omnivores. Children may think that all carnivores/herbivores/ omnivores eat the same diet and not consider the food available in their habitats.
8	**Food chains** Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.	Working scientifically − Gathering and recording data to help in answering questions.	In the previous small step, children learnt about habitats and diets. In this small step, children build on this understanding and simple food chains for the first time. They will use their knowledge about carnivores, herbivores and omnivores when creating food chains. Food chains should be used to show how energy is passed from one plant/animal to another animal. Children should identify that a food chain usually starts with a plant. They should discuss how different living things rely on each other to survive. Children may also be able to explain what would happen if one part of a food chain were removed.	Food chain, carnivore, herbivore, omnivore, diet	Children may not realise that energy is passed within a food chain. Children may not fully understand the implications of one part of the food chain being removed. Children may not draw arrows the right way round to show the passing of energy on their food chains.
9	**Living, dead or never alive?** Explore and compare the differences between things that are living, dead, and	Working scientifically − Identifying and classifying.	In the final step of this block, children explore and compare the differences between things that are living, things that are dead and things that have never been alive. An important distinction is the difference between something that is dead and something that has never been alive, for example a dead plant and a stone. Explain to the children that animals and plants are living	Living, dead, never alive, plant, animal	Children may confuse things that are dead and things that were never alive. The topic of living things dying needs to

	things that have never been alive.		things that need certain things to survive. Encourage children to make links between this step and Autumn Block 1. There can be many reasons that a living thing dies but one reason is that they do not get enough of one of the things needed for survival, such as food. This is different from something that was never alive, such as rocks, water or toys.		be approached with extra care and sensitivity.

Unit Summary	
Term	**Spring (1 Lesson)**
Topic	**Biology: Plants (light and dark)**
The Big Picture	In this unit, pupils review the results of a previous experiment comparing plant growth in light and dark conditions. They observe and measure differences between the two plants, focusing on height, colour, and overall health. Through this comparison, children learn that while a plant might still grow in the dark, it is often weak and unhealthy, showing that plants need both water and sunlight to grow properly. This unit helps children draw simple conclusions from evidence and strengthens their scientific enquiry skills, including observation, measurement, and explanation.
Key Knowledge	• Plants need light and water to grow and stay healthy. • Plants grown in the dark may grow but are weaker**.** • Plants grown in the light are stronger and greener.
Enquiry Question	Do plants grow healthier in the light or dark?
Enquiry Type	Comparative test

Intended Learning

Lesson	**Learning Objective / National Curriculum link.**	**Skill Objective**	**Brief Overview**	**Key Vocabulary**	**Things to look out for**
1	**Findings – light and dark** Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	Working scientifically – Gathering and recording data to help in answering questions.	In this small step, children look at their findings for the comparative test they started in Block 1. They observe changes between the plant kept in the light and the one kept in the dark. Children should compare the two plants and suggest simple reasons for these differences. They may need to recap what a plant needs in order to stay healthy. Children do not need to look at how temperature affects plant growth, as this is something they will investigate in the summer term. Within this step, there are opportunities for children to measure and compare the growth of both plants using appropriate measurements.	Plant, seed, sunlight, living, dead	Depending on the outcome of the investigation, the plant which has been kept in the dark may have grown as tall as the plant with access to light. Ensure that children are

			They should decide how they will measure the length of the plants using equipment, such as rulers. Children should provide an answer for the enquiry question within this step. Do plants grow healthier in the light or dark?		looking at the overall health of the plant when discussing their findings

Unit Summary	
Term	**Summer (4 Lessons)**
Topic	**Biology: Plants (bulbs and seeds)**
The Big Picture	In this unit, pupils learn that plants can grow from both seeds and bulbs, each with different parts and appearances. They explore and compare a range of seeds and bulbs, observing features like roots and shoots. The unit focuses on what plants need to grow well—water, light, and the right temperature—and children investigate how these conditions affect plant growth. By planting bulbs and seeds in different environments, they make predictions, observe changes over time, and measure growth. This helps them understand the life cycle of plants and builds key scientific skills like observation, recording, and enquiry.
Key Knowledge	• Plants need water, light, and a suitable temperature to grow and stay healthy. • Seeds can be found inside or outside fruit, and bulbs store food to help plants grow again.
Enquiry Question	How do bulbs and seeds change over time?
Enquiry Type	Observation over time

Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**Bulb or seed?** Observe and describe how seeds and bulbs grow into mature plants.	Working scientifically – Observing closely, using simple equipment.	In the previous Plants block, children explored the parts of plants and conditions for their growth. In this small step, they build on this knowledge as they look at the differences between bulbs and seeds. Children should see a variety of bulbs and seeds and be confident with their definitions before they think about growing conditions for bulbs and seeds later in the block. Within this step, children should use simple equipment such as hand lenses to make accurate observations. Children should look at common bulbs and observe shoots and roots, such as those from daffodils, onions and garlic. Children should look at seeds both inside and outside fruits, such	Plant, bulb, seed, shoot, root	Children may only have experienced plant growth from seeds and may not be familiar with plants which grow from bulbs. Children may think that seeds can only be found on the inside of a

			as seeds in sweet peppers, seeds in strawberries and sunflower seeds. Encourage children to sort and group the bulbs and seeds in different ways.		fruit. This can be overcome by children looking at a range of seeds.
2	**What do plants need to grow?** Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	Working scientifically − Record and communicate their findings in a range of ways and begin to use simple scientific language (non-statutory).	In the previous step, children explored how plants can grow from bulbs and seeds. Children have now looked at temperature in maths, so they can apply this understanding in science to look at temperature as a condition for plant growth. In this step, children look at the best conditions for plant growth, focusing on temperature. They do not need to understand the germination process in this step, because this concept is covered in Year 3 Children should observe that some plants grow indoors and some plants grow outdoors. The plants they have planted so far have been indoors as it has been winter and spring. Now it is summer, they should understand that plants can grow outside as it is warmer.	Seed, plant, temperature, sunlight, growth	Children may not realise that some plants still grow in winter. Plants can survive outside in cooler temperatures, but they grow more slowly.
3	**Plan – bulbs and seeds** Observe and describe how seeds and bulbs grow into mature plants.	Working scientifically − Asking simple questions and recognising that they can be answered in different ways.	In this small step, children begin an observation over time enquiry. They explore how the bulbs and seeds they plant change over time. Depending on weather conditions, children could plant some bulbs and seeds inside and some outside. Children do not need to use the term “germination” until Year 3 During this investigation, children grow bulbs and seeds under different temperature conditions, such as in pots outside and inside, or in pots in cooler and hotter areas of the school. Light and dark conditions were observed in the previous Plants block. Here, the effect of changing the temperature the plant is kept at can be observed. Children will make predictions and should create a schedule for recording plant growth. How do bulbs and seeds change over time?	Bulb, seed, plant, temperature, growth	Bulbs planted in summer can take longer to reach maturity after sprouting than those planted in autumn, winter or spring. When planting outside, be aware that local wildlife may eat the bulbs or seeds. The bulbs or seeds can be protected using recycled plastic bottles.
4	**Plant – bulbs and seeds** Observe and describe how seeds and bulbs grow into mature plants.	Working scientifically − Performing simple tests.	In this step, children grow bulbs and seeds under different temperature conditions. This could include pots outside and inside, or in pots in cooler and hotter areas of the school. Here the effect of changing one condition can be observed over time. Depending on the weather, some of the work may be completed outside. Children have made predictions and should have created a schedule for recording plant growth in the previous step. Children should plant their bulbs and seeds in each of their chosen locations. Throughout the experiment, children should	Bulb, seed, compost, measurement, observe	The amount of water may be different for each bulb or seed depending on the location it is kept in. For example, if it is kept outside and it is particularly hot,

			regularly check on their plants and make careful observations and measurements of the plants in the different conditions. They should record the changes that they observe over time.		more water would be needed than for the bulb/seed kept indoors. When planting outside, be aware that local wildlife may eat the bulbs or seeds. These bulbs and seeds can be protected using recycled plastic bottles.

Unit Summary	
Term	**Summer (6 Lessons)**
Topic	**Biology: Growing up**
The Big Picture	In this unit, pupils learn that all animals, including humans, have offspring that grow and develop into adults. They begin by exploring the relationship between parents and their young, learning that some animals give birth to live young while others hatch from eggs. The unit introduces life cycles, starting with humans and then comparing the stages of growth in mammals, amphibians like frogs, and insects like butterflies. Children identify and sequence the stages of each life cycle, observing how animals change as they grow. Through hands-on activities and comparison tasks, they begin to notice patterns and differences between life cycles, developing a clearer understanding of how all living things grow and change over time.
Key Knowledge	• All animals, including humans, have offspring that grow into adults**.** • Some animals give birth to live young, while others hatch from eggs. • Animals grow through life cycle stages, like baby, child, and adult. • Different animals have different life cycles, but all go through changes as they grow.
Enquiry Question	Are there patterns between the life cycles of different animals?
Enquiry Type	Pattern seeking
Intended Learning	

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	Parent and offspring Notice that animals, including humans, have offspring which grow into adults.	Working scientifically – Identifying and classifying.	In this block, children are introduced to the processes of growth in animals. This small step introduces the term "offspring" for the first time. Children should identify that "offspring" refers to an animal's young. Children may be familiar with some names of animal offspring, however, the specific names for the range of animal's offspring should be taught in this step. Humans and their offspring should also be introduced. Children should be able to identify an animal and its offspring through sorting and matching activities. Use this step to recap the animal groups explored in Autumn Block 1 (mammals, birds, fish, amphibians and reptiles). Children do not need to understand or use the term "reproduction" within this step.	Offspring, growth, parent, adult, egg	Children may think that all animals give birth to live young. However, some animals are born from eggs. Offspring of different animals can share the same name. For example, a calf is the name for offspring from cows, whales, elephants and camels.
2	Life cycle of humans Notice that animals, including humans, have offspring which grow into adults.	Working scientifically – Asking simple questions and recognising that they can be answered in different ways.	In the previous small step, children defined "offspring" as the young of a living thing, and identified the names of offspring for different animals. In this small step, children look at a life cycle for the first time and explore the stages in the life cycle of a human. Children should recap the key characteristics of a mammal and be reminded that humans are mammals. Children are introduced to a simple human life cycle, including baby, child, teenager and adult. They should identify simple changes that occur within each life stage. Changes related to puberty do not need to be discussed, because these will be taught in Year 5. In this step, children are introduced to the enquiry question for this block. Are there patterns between the life cycles of different animals? In the following steps, children explore the life cycles of different animals. In the final step, children will be asked to spot patterns between the different life cycles.	Baby, child, teenager, adult, life cycle	Children may think that humans are not animals. Highlight the similarities in characteristics between humans and other mammals (they give birth to live offspring, produce milk and have hair).
3	Life cycles of different mammals Notice that animals, including humans,	Working scientifically – Record and communicate their findings in a range of ways and begin to use simple scientific	In this small step, children build on their knowledge of the human life cycle from Step 2 to explore simple life cycles of a range of mammals. Children should compare the life cycle of humans with other mammals, noticing patterns, similarities and differences. Emphasise that as humans are mammals, their life cycles are similar. Children should	Mammal, life cycle, baby, adolescent, adult	Most mammals have species-specific names for the first stages of the life cycle, such

	have offspring which grow into adults.	language (non-statutory).	be introduced to the term “adolescent” rather than “teenager” when describing other mammals. By the end of this step, children should be able to describe familiar mammals’ life cycles. They should identify that baby mammals need milk from their mother before they learn to eat solid food, move and play. As adolescents, mammals gain independence. Most mammals become adults in less time than humans.		as puppy, rather than baby. Children may think that humans are not mammals. Make clear the similarities in characteristics (they give birth to live offspring, produce milk and have hair).
4	Life cycle of amphibians Notice that animals, including humans, have offspring which grow into adults.	Working scientifically − Identifying and classifying.	In this small step, children develop their understanding of life cycles by exploring the simple life cycle of a frog. Children may need to recap the characteristics of adult amphibians before exploring how frogs grow. These include being able to live on land and in water, not having scales and laying eggs. By the end of this step, children should be able to identify the life stages of a frog as frogspawn (eggs), tadpole, young frog (froglet) and adult frog. If possible, create an area to attract frogs, so that children can observe the life cycle directly. Making simple comparisons between the life cycle of amphibians and the life cycle of mammals will prepare children to answer the enquiry question at the end of this block.	Life cycle, frog spawn, amphibian, tadpole, froglet	Children may not think of frogspawn as being an egg. Comparing examples of different eggs may help children to identify any similarities and differences. Children may think that tadpoles are fish, because of their shape and behaviour, rather than a stage in a frog’s life cycle.
5	Life cycle of a butterfly Notice that animals, including humans, have offspring which grow into adults.	Working scientifically − Observing closely, using simple equipment.	In this small step, children explore the simple life cycle of a butterfly. They learn that a butterfly is an insect. Children looked at the general definition of an insect in Autumn Block 1, and this is explored in more detail in Year 4. They should also learn that the life cycle of a butterfly is egg, caterpillar, pupa and butterfly. Give children the opportunity to observe the life cycle of a butterfly directly with a reusable butterfly kit. This allows them to observe how a caterpillar changes and develops over time. It will also be useful later this term, where children produce a butterfly diary. Ensure there is a small supply of fresh fruit for the butterflies to feed on.	Life cycle, egg, caterpillar, butterfly, pupa	As caterpillars and butterflies look so different, children may think that these are two separate animals. The hatching process takes approximately four weeks. Ensure enough hatching time is provided before

					reviewing the findings in Summer Block 4. Hatching kits should be placed where children can observe but not touch, because this may impact on the hatching process.
6	Are there patterns between the life cycles of different animals? Notice that animals, including humans, have offspring which grow into adults.	Working scientifically – Using their observations and ideas to suggest answers to questions.	In this small step, children look at the life cycles of all the different animal groups explored throughout the block and will provide an answer for the enquiry question. They should be encouraged to spot patterns, as well as similarities and differences, based upon the observations that they have made. Throughout this step, children should be referring to all the life cycles taught and should be encouraged to identify "offspring". Children should recognise that offspring are born in different ways, such as live young for most mammals and eggs for other animal groups. They may also notice that each life cycle lasts for a different length of time. Encourage children to group images or provide verbal or written responses to highlight any similarities and differences between animal life cycles.	Life cycle, egg, amphibian, compare, mammal	Some offspring look different to the parent. Children may think that these are two different animals. Children should be encouraged to look at the similarities and differences in characteristics throughout the steps of the life cycle.

Unit Summary	
Term	**Summer (1 Lessons)**
Topic	**Biology: Plants (bulbs and seeds)**
The Big Picture	In this unit, pupils revisit the plants they grew earlier in the term to observe how bulbs and seeds have changed over time. They measure and compare the growth of their plants using simple equipment like rulers and cubes, identifying differences based on growing conditions such as temperature. The unit reinforces the idea that plants need water, light, and suitable temperature to grow and stay healthy. Children reflect on their earlier predictions and use their observations to draw simple conclusions, helping them develop key scientific enquiry skills such as measuring, comparing, and explaining findings.
Key Knowledge	• Plants need water, light, and the right temperature to grow and stay healthy.

	• Some plants grow from seeds**,** and others grow from bulbs**.** • Seeds and bulbs grow in different ways**,** but both develop into mature plants.
Enquiry Question	How do the bulbs and seeds change over time?
Enquiry Type	Observation over time

Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**Findings – bulbs and seeds** Observe and describe how seeds and bulbs grow into mature plants.	Working scientifically – Observing closely, using simple equipment.	In this small step, children look at their findings from planting bulbs and seeds in Summer Block 1. They should observe any changes and growth in the bulbs and seeds and reflect on the different growing conditions. Children should be encouraged to refer to their prediction from Block 1 and explain how their plants have changed over time. It may be useful to recap what bulbs and seeds need in order to grow into healthy plants. This will help them to provide an explanation for their findings. Children should be encouraged to provide conclusions which refer to light, temperature and water. Within this step, there are opportunities for children to measure the growth of the plants and compare the results from different temperature conditions. It may be useful to add these measurements to the table on the worksheet.	Bulb, seed, plant, temperature, growth	Children may find it difficult to measure from the base of the plant and may need help with this. Children need to be aware that adverse weather conditions can have an impact on plant growth outdoors.

Unit Summary	
Term	**Summer (1 Lesson)**
Topic	**Biology: Growing up**
The Big Picture	In this unit, pupils observe and record the life cycle of a butterfly, building on their previous learning about animal life cycles. Using a butterfly hatching kit, they watch as the caterpillar transforms into a pupa and then into an adult butterfly, recording each stage in a butterfly diary with drawings, labels, and simple descriptions. They learn and use terms like egg, caterpillar, pupa, and butterfly to describe the process. Children also compare the butterfly's life cycle to those of other animals, such as frogs and mammals, identifying similarities and differences. This unit strengthens their observation and recording skills and deepens their understanding of how living things grow and change.

Key Knowledge	• The life cycle of a butterfly consists of egg, caterpillar, pupa and butterfly.
Enquiry Question	Are there patterns between the life cycles of different animals?
Enquiry Type	Pattern seeking

Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**Butterfly diary** Notice that animals, including humans, have offspring which grow into adults.	Working scientifically – Observing closely, using simple equipment.	In this small step, children record their first-hand observations of the life cycle of a butterfly. Children should have had the opportunity to observe the life cycle of a butterfly directly with a butterfly kit, so they could observe how a caterpillar changes and develops over time. The hatching kit should have been set up during Step 5 of the previous Growing up block to allow time for the children to observe and record their findings. This can take approximately four weeks. Children should apply their understanding of life cycles from the previous blocks. Children should recall that the life cycle of a butterfly consists of egg, caterpillar, pupa and butterfly. They should use these terms when describing their observations.	Life cycle, egg, caterpillar, pupa, butterfly	As caterpillars and butterflies look so different, children may think that these are two separate animals. Allow approximately four weeks' hatching time before this step. Hatching kits should be placed where children can observe but not touch, as this may impact on the hatching process.

Unit Summary

Term	**Summer (2 Lessons)**
Topic	**Sustainability: Wildlife**
The Big Picture	In this unit, pupils learn what wildlife is and why it is important to both people and the planet. They discover that wildlife includes animals and plants that live freely in nature and are not looked after by humans. Children explore how wildlife helps us—for example, worms improve soil for growing food, and insects help plants by pollinating them. They also learn that all living things are connected through food chains. The unit encourages children to look at local habitats and microhabitats,

	helping them understand how they can support wildlife in their own community. Practical activities such as making seed bombs, bug hotels, or bird feeders help children see how they can care for the environment without disturbing it. Throughout the unit, children develop their observation and enquiry skills while learning how humans, animals, and plants depend on each other.
Key Knowledge	• Wildlife refers to animals and plants that live in nature and are not cared for by humans. • Wildlife helps humans by supporting healthy ecosystems, such as worms improving soil and insects pollinating plants. • All living things are connected**,** and rely on each other to survive (e.g., through food chains). • Local habitats and microhabitats can be home to important wildlife. • We can care for wildlife by creating things like bug hotels, seed bombs, and bird feeders without disturbing natural environment.
Enquiry Question	Why is it important to care for wildlife?
Enquiry Typle	Sustainability

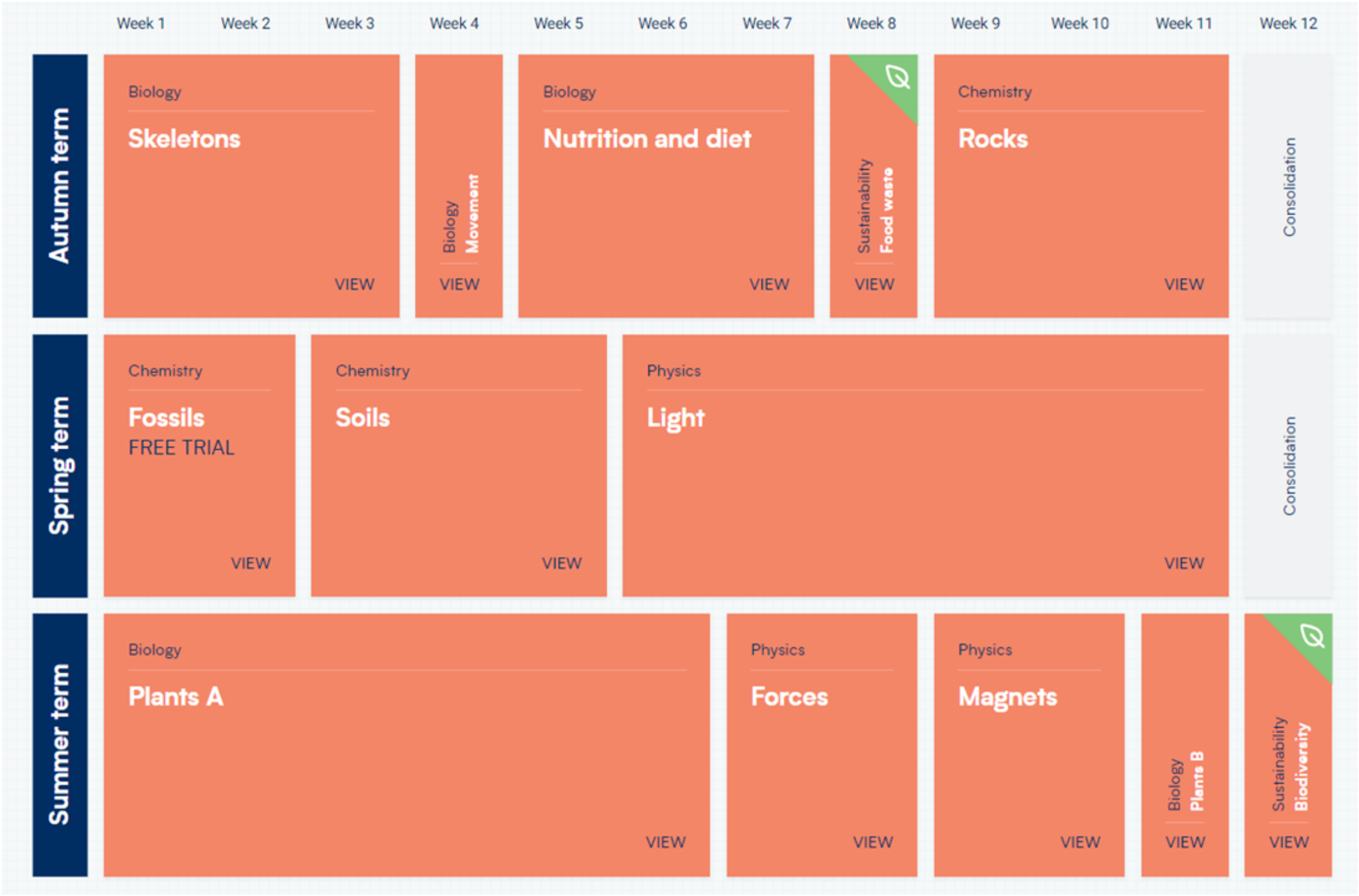
Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**What does wildlife do for us?**	Working scientifically – Asking simple questions and recognising that they can be answered in different ways.	In this small step, children explore how wildlife is beneficial for humans. In previous blocks, they explored different animals and plants and their needs for survival. In this step, they should apply this knowledge in a real-life context. Children are introduced to the word “wildlife” in this step. They can define this term as plants and animals that are not looked after by humans. Within this step, children learn that humans, other animals and plants can all depend on each other for survival. In this block, children should explore their local area as much as possible to identify any wildlife. Ideas for how to work practically have been highlighted in the practical ideas section. Why is it important to care for wildlife?	Food chain, wildlife, habitat, crops, insect	Children may need to recap different habitats taught in the Spring term. This should also include microhabitats. Children may not recognise that local areas can be home to wildlife. Encourage children to look for plant and animal life in microhabitats within the local area.
2	**What can we do for wildlife?**	Working scientifically – Using their observations and	In this small step, children look at how they can care for wildlife in their local area. In the previous step, they explored the term “wildlife” and the ways animals and	Wildlife, habitat, nature, local	Children should understand that supporting wildlife

		ideas to suggest answers to questions.	plants help humans. Children should explore the ways in which they can support wildlife within the school environment. This helps develop their understanding of life cycles, growth and responsibility for the planet. Wildlife projects that support the local ecosystem could include creating hedgehog houses, bug hotels, seed bombs or growing a mini wildlife garden. If outdoor space is limited, children could hang bird feeders on fences, trees or within the playground. Children may be excited by seeing local wildlife, but encourage them to observe and not touch		is a long-term process. Children may think that all actions to support wildlife are helpful. It is important that they do not physically disturb wildlife when they are trying to help.

Year 3

Autumn	Spring	Summer
Biology: Skeletons Biology: Movement Biology: Nutrition and diet Sustainability: Food Waste Chemistry: Rocks	Chemistry: Fossils Chemistry: Soil Physics: Light	Biology: Plants A Physics: Forces Physics: Magnets Biology: Plants B Sustainability: Biodiversity


Week 1
Week 2
Week 3
Week 4
Week 5
Week 6
Week 7
Week 8
Week 9
Week 10
Week 11
Week 12
Autumn term
Biology
Skeletons
VIEW
Biology
Movement
VIEW
Biology
Nutrition and diet
VIEW
Sustainability
Food waste
VIEW
Chemistry
Rocks
VIEW
Consolidation
Spring term
Chemistry
Fossils
FREE TRIAL
VIEW
Chemistry
Soils
VIEW
Physics
Light
VIEW
Consolidation
Summer term
Biology
Plants A
VIEW
Physics
Forces
VIEW
Physics
Magnets
VIEW
Biology
Plants B
VIEW
Sustainability
Biodiversity
VIEW

Topic Context

Pupils start the Autumn Term by looking at ‘Skeletons’. Pupils begin by looking at human skeletons before moving on to identifying simple bones in the skeletons of other animals. Pupils are familiar with ‘themselves’ from learning undertaken in Year 1 and 2, so can use this prior knowledge to help them understand the skeletal system.

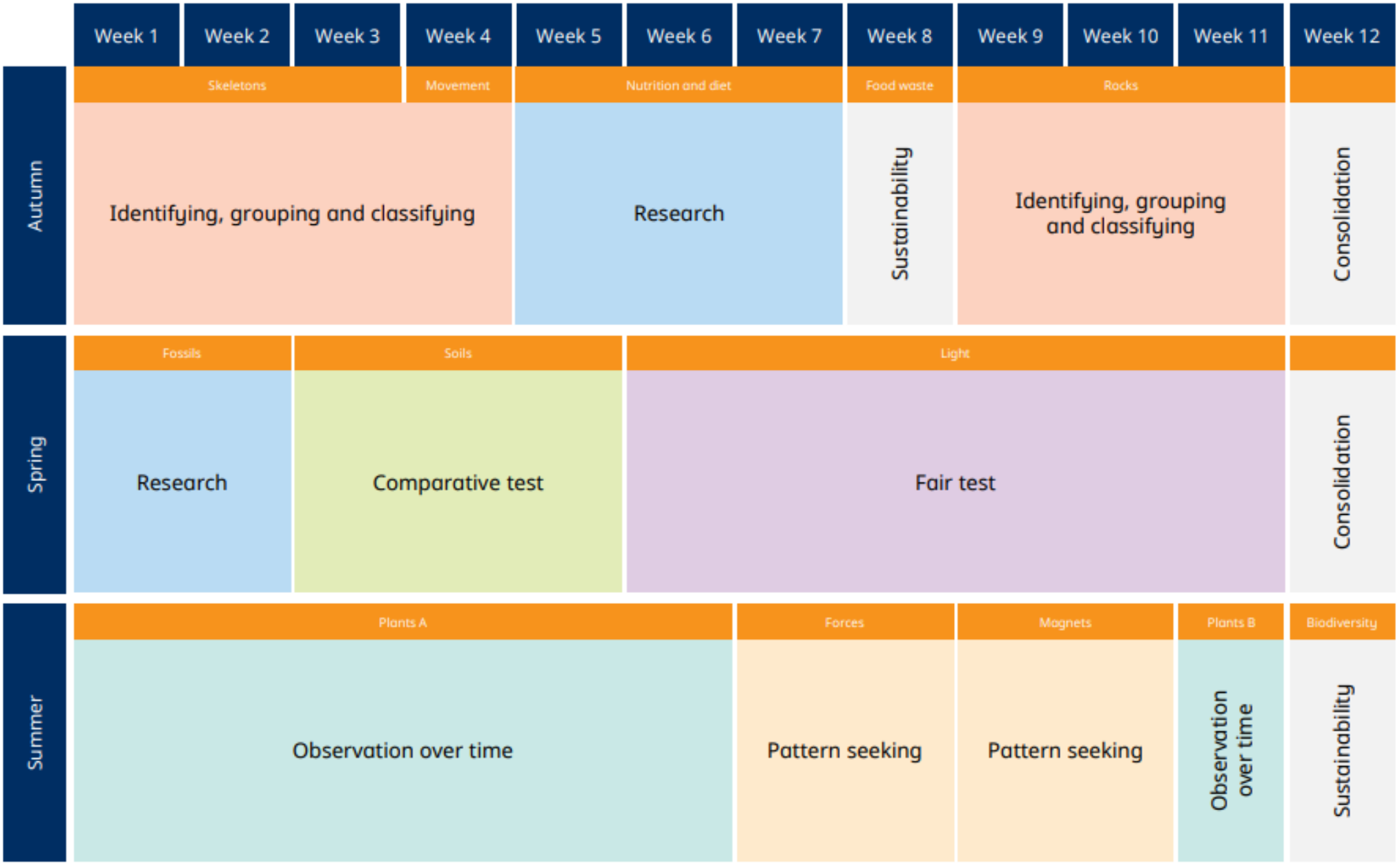
The ‘Animals including humans’ unit is split into three blocks across the Autumn Term, so pupils have a good understanding of the skeleton before looking at movement, then finally nutrition and diet.

The ‘Rocks’ unit of the National Curriculum is split over three blocks to allow pupils to gain a secure understanding of each area before moving onto the next. Pupils can also use their new knowledge of skeletons in the ‘Fossils’ block to identify the imprint of any familiar bones.

In the summer term, pupils look at ‘Plants’. They can use their knowledge of light and soils from the Spring Term to explore how plants use light and soil to survive.

The ‘Forces and Magnets’ unit has been split into two blocks in the Summer Term, as this topic can be quite abstract for pupils. We start by looking at examples of contact forces in the forces block, before looking at non-contact forces in the magnets block.

Enquiry Types Mapped



Unit Summary	
Term	**Autumn (5 Lessons)**
Topic	**Biology: Skeleton**
The Big Picture	In this unit, pupils are introduced to the human skeleton and explore the diversity of skeletal structures across the animal kingdom. Pupils will learn to identify and name key bones in the human body, such as the skull, femur, pelvis, spine, and ribcage, and understand their functions in providing support, protection, and enabling movement. They will then extend this knowledge to a range of animals, identifying bones in different animal skeletons and categorizing animals based on whether they possess a spine or an exoskeleton. The unit culminates with pupils critically evaluating and discussing how various animals can be grouped and sorted based on their unique skeletal systems.
Key Knowledge	• A skeleton is a collection of bones that provides support, protection, and allows movement. • Pupils can identify and name key human bones like the skull, spine, ribcage, pelvis, and femur, and know their functions. • Many animals also have skeletons, which vary in structure. • Animals can be grouped by whether they have a spine or an exoskeleton.
Enquiry Question	How can animals be sorted and grouped based on their skeletons?
Enquiry Type	Identifying, grouping and classifying

Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**Identify and name bones in the human body** Identify that humans and some other animals have skeletons and muscles for support, protection and movement.	Working scientifically – Asking relevant questions and using different types of scientific enquiries to answer them.	In this small step, children explore the human skeleton for the first time by identifying and naming bones. There are lots of bones in the human skeleton, many of which have complex names. The focus of this small step is on the skull, femur, pelvis, spine and ribcage. Some of these are made up of several bones, which will be covered in more detail in the following steps. By the end of this step, children should be able to identify, name and locate these bones in the human body. The enquiry question for this block is “How can animals be sorted and grouped based on their skeletons?” This is an identifying, classifying and grouping enquiry. Within this step, children can create relevant questions to begin the enquiry process.	Skeleton, ribcage, skull, pelvis, spine, femur	Children may think that the skeleton is one large bone, rather than lots of bones. Children may believe that bones in the body do not have specific names, for example, they may think all bones in the leg are called “leg bones”.

					Children may think that the arms and legs have one long bone, rather than multiple bones.
2	**Functions of the skeleton** Identify that humans and some other animals have skeletons and muscles for support, protection and movement.	Working scientifically – Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.	In this small step, children learn that humans have a skeleton for movement, support and protection. They build on their learning from the previous step as they progress to outlining the functions (or jobs) of the spine, ribcage, pelvis, skull and femur. It is important that children are aware of the function of the skeleton and also the jobs of specific bones. They should be able to describe the importance of humans having a skeleton with reference to movement, support and protection. The specific details about how the skeleton aids movement will be covered in Autumn Block 2	Skeleton, ribcage, skull, pelvis, spine, femur	Children may think that bones within the skeleton do not have a function. Children may believe that all bones must protect an internal organ, like the skull and ribcage do. Children may think that all bones have the same function.
3	**Identify and name bones in a range of animals** Identify that humans and some other animals have skeletons and muscles for support, protection and movement.	Working scientifically – Talk about criteria for grouping, sorting and classifying (non-statutory).	In this small step, children learn that some animals have a skeleton. They use their knowledge of bones in the human skeleton to identify, locate and name bones in a variety of animals. It is important that children are shown a wide range of animal skeletons including mammals, birds, fish, amphibians and reptiles. This allows them to label the bones of the skeleton and spot any similarities or differences between them. Children do not need to use the term “vertebrate” because this is not introduced until Year 4 Children have the opportunity to sort and group animals as their understanding of the enquiry question develops.	Mammal, bird, fish, reptile, amphibian	Children may think that humans are not mammals and that other mammals have a different skeletal system to humans. Children may think that all animals have a skull, spine, femur, pelvis and ribcage. Show examples of a wide range of animals to challenge this misconception.

4	**Animals with and without a spine** Identify that humans and some other animals have skeletons and muscles for support, protection and movement.	Working scientifically – Talk about criteria for grouping, sorting and classifying (non-statutory).	In this small step, children look at animals that have a spine and animals that do not. Children should use the terms “with a spine” and “without a spine” when grouping animals, not “vertebrate” and “invertebrate” because this vocabulary is not introduced until Year 4. They are introduced to the term “exoskeleton” to describe an animal with a skeleton on the outside of its body. Children should explore a wide range of animals including insects, spiders, slugs and snails to allow them to further their understanding of animals with a spine and without a spine. Children continue to develop their answers to the enquiry question for this block by sorting and grouping animals in different ways.	Spine, antennae, exoskeleton, insect	Children may think that if an animal does not have a spine, then it cannot move. Children may believe that all animals without a spine have no form of skeleton. Children may think that all animals without a spine have an exoskeleton. They should be shown a range of animals without a spine or exoskeleton to address this.
5	**Are all skeletons the same?** Identify that humans and some other animals have skeletons and muscles for support, protection and movement.	Working scientifically – Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.	In the final step of this block, children provide answers to the enquiry question “How can animals be sorted and grouped based on their skeletons?” They should identify, sort and group animals in different ways based on their skeletal systems. Children should consider mammal, bird, fish, amphibian and reptile skeletons when forming their answers. In addition to this, they could compare animals with and without a spine to develop a deeper understanding of skeletons. Children should be given opportunities to present their findings to a wider audience. This can include presentations, discussions and written responses.	Skeleton, spine, exoskeleton	Children may think that all skeletons are the same and have the same bone structure. When looking at specific groups, children may think that all animals within that group have the same skeletal structure. For example, snakes and lizards are both classified as reptiles but have very different skeletons. Another example

					of this could be humans and whales.

Unit Summary	
Term	**Autumn (2 Lessons)**
Topic	**Biology: Movement**
The Big Picture	In this unit, pupils explore the human body's skeletal and muscular systems and how they work together to enable movement. Pupils will build upon their knowledge of the skeleton by identifying different types of joints, specifically hinge and ball-and-socket joints, and understanding how they allow various movements. The unit then delves into the function of muscles, teaching pupils that muscles are attached to bones, can only pull (not push), and work in pairs by contracting and relaxing to facilitate movement. Through practical activities and models, pupils will understand how bones, muscles, and joints collaborate to create motion in humans and other animals.
Key Knowledge	• Joints are where bones connect, allowing movement. • There are different types of joints, like hinge (knees, elbows) and ball-and-socket (hips, shoulders). • Muscles are attached to bones and work in pairs, contracting and relaxing to pull on bones. • Bones, muscles, and joints all work together to enable movement.
Enquiry Question	How can animals be sorted and grouped based on their skeletons?
Enquiry Type	Research

Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**Joints** Identify that humans and some other animals have skeletons and muscles for support, protection and movement.	Working scientifically – Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations (non-statutory).	In this small step, children build on their knowledge of the skeleton by looking at joints. Children identify two different joint types – hinge and ball-and-socket joints. They should identify and name the hips, elbows, knees and shoulder joints and decide whether these are examples of hinge or ball-and-socket joints. Children should understand that major bones in the human body are connected by joints, for example the hip joints connect the pelvis and femurs. By the end of this step, children should understand that joints allow the skeleton to move, and that without joints, humans would not be able to move. Within this step, children should have the opportunity to explore that many other animals have joints. They use simple diagrams of	Joint, hinge joint, ball and socket joint, skeleton	Children may think that all joints allow movement in the same way. Images or simple models of each joint type would help children to spot differences between the movement patterns.

			skeletons to identify the hip, elbow and knee joints in different animals.		
2	**How we move** Identify that humans and some other animals have skeletons and muscles for support, protection and movement.	Working scientifically – Communicate their findings in ways that are appropriate for different audiences (non-statutory).	In this small step, children learn how the skeleton, joints and muscles work together to allow movement. This step should be used to recap the names of the bones studied in Block 1 and the joint types identified in the human body in Step 1 of this block. Children learn that muscles pull on bones to create movement. Muscles cannot push, which is why they work in pairs. Children learn the terms "contract" and "relax" to describe this process. In Year 3, children do not need to name and label major muscle groups in the human body. They identify and label only the biceps and triceps in the upper arm. Children can use labelled diagrams, simple practical models and relevant scientific language to show their understanding.	Joint, muscle, tricep, bicep, contract, relax	Children may think that muscles work independently. Explain that muscles work in pairs to allow movement. Demonstrate this idea by asking children to contract their biceps. The biceps contract as the triceps relax.

Unit Summary	
Term	**Autumn (5 Lessons)**
Topic	**Biology: Nutrition and Diet**
The Big Picture	In this unit, pupils explore the importance of healthy eating for humans and animals. Pupils learn about the five main food groups (fruit and vegetables, carbohydrates, proteins, dairy, fats, and sugars) and how each contributes to the body's health. They will understand what constitutes a balanced diet and why it is crucial for maintaining good health, comparing different human diets such as vegan, vegetarian, pescatarian, and omnivorous. The unit concludes by extending this knowledge to the animal kingdom, where pupils differentiate between carnivores, herbivores, and omnivores, recognizing that animals obtain their nutrition from what they eat.
Key Knowledge	• Pupils learn about the five food groups and their importance for human health. • They understand what a balanced diet is and why it's essential. • Pupils compare different human diets (vegan, vegetarian, pescatarian, omnivorous). • They classify animals as carnivores, herbivores, or omnivores based on their diet.
Enquiry Question	What is a balanced diet and is it important?
Enquiry Type	Research
Intended Learning	

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**Food groups** Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat.	Working scientifically – Talk about criteria for grouping, sorting and classifying (non-statutory).	In this small step, children learn that food can be sorted into five food groups – fruit and vegetables, carbohydrates, proteins, dairy products (and alternatives) and fats and sugars. They group and sort food correctly into each group. They do not look at the effect of each food group on the body as this is introduced in the next small step. Children discuss which food items they should eat regularly, sometimes and occasionally. They look at the concept of a "balanced diet" in greater detail later in the block. The enquiry question is introduced in this small step. Children will carry out a research enquiry and use secondary sources to help them answer the enquiry question. What is a balanced diet and is it important?	Carbohydrates, protein, dairy products, fats, sugars	Children may think that all food has the same nutritional benefits for the body. Children may think that drinks have no impact on a healthy/balanced diet. Children may use their personal preferences to sort food based on whether it should be eaten regularly, sometimes or occasionally.
2	**Understand the five food groups** Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food – they get nutrition from what they eat.	Working scientifically – Using straightforward scientific evidence to answer questions or to support their findings.	In this small step, children learn about the effects of different food groups on the body. These include the effects of fruit and vegetables, carbohydrates, proteins, dairy products and alternatives and fats and sugars. In this step, children explore the effects of having too much or too little of a particular food group. They look at the effects of fats on the body. They learn that fats can be classified as healthy (unsaturated) or unhealthy (saturated) and that they have different impacts on the body. Children continue to investigate the enquiry question in this step. They should be given plenty of opportunities to develop their research skills to gain a better understanding of the different food groups, their effects and their importance for the body.	Carbohydrates, protein, dairy products, fats, fruit and vegetables	Children may believe that all foods that are classified as proteins are meat products. Children may think that adults who follow a vegan or vegetarian diet cannot get any protein within their diet.
3	**Balanced diets** Identify that animals, including humans, need the right types	Working scientifically – Reporting on findings from enquiries, including oral and written explanations,	In this small step, children explore what a balanced diet is and learn about its importance in maintaining good health. By the end of this step, children should understand that a variety of different foods are needed for a balanced diet and that it is also important to eat the correct amount of	Balanced diet, balanced meal, nutrition, Eatwell Guide	Children may believe that all food groups need to be eaten in equal amounts

	and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat.	displays or presentations of results and conclusions.	each food group. Children should provide answers to the enquiry question, “What is a balanced diet and is it important?”. They could demonstrate their understanding through sorting and grouping different foods, giving presentations, having discussions or giving written or verbal explanations of a balanced diet. Publications such as The Eatwell Guide provide children with visual representations of how much of each food group should be consumed.		and may design a meal that is not nutritionally balanced. Children may incorrectly classify food in their meal. For example, they may state that potatoes are their source of vegetables, rather than a source of carbohydrates.
4	**Compare diets** Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat.	Working scientifically – Identifying differences, similarities or changes related to simple scientific ideas and processes.	In this small step, children build on their understanding of a balanced diet. They look at food choices and compare different diets. Children learn that vegan and vegetarian diets are similar, but not exactly the same. Vegetarians do not eat meat whereas vegans do not eat any animal products. Children also explore a pescatarian diet, which contains fish but no other meat products. Children should understand that vegans and vegetarians find alternatives for animal and dairy products and that these provide the body with the nutrients it needs. By the end of this step, children should understand that humans have different diets depending on their food choices, and that it is possible to have a balanced diet without eating animals or animal products.	Vegan diet, vegetarian diet, pescatarian diet, omnivorous diet	Children may think that all humans have the same dietary requirements. Children may think that there are no similarities between a vegan, vegetarian, pescatarian and omnivorous diet. Children may think that people who follow a vegetarian or vegan diet are unable to get protein-rich food.
5	**Animal diets** Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own	Working scientifically – Using straightforward scientific evidence to answer questions or to support their findings.	In this final step of the block, children look at the wider animal kingdom to learn about the dietary requirements of different animals. They should use the terms “carnivore”, “herbivore” and “omnivore” to differentiate between different animals’ dietary needs. Children identify and name a range of animals and state whether they are carnivores, herbivores or omnivores. This should include animals that are kept as pets and animals that live in the wild. Children also look at how animals’ teeth indicate the	Diet, herbivore, omnivore, carnivore	Children may incorrectly group carnivores, herbivores and omnivores. Children may believe that animals that are

	food; they get nutrition from what they eat.		sort of diet they have. For example, how carnivores have sharper teeth than herbivores to allow them to eat other animals. They do not need to name the teeth, as this is covered in the Year 4 curriculum.		kept as pets eat the same food as those in the wild. Highlight to children that animals' diets may differ depending on whether they hunt for food or not.

Unit Summary	
Term	**Autumn (2 Lessons)**
Topic	**Sustainability: Food Waste**
The Big Picture	In this unit, pupils are introduced to the concept of food waste and its environmental impact. Pupils will learn what constitutes food waste (food safe to eat but discarded) and understand that a significant amount ends up in landfill sites, where it decomposes and negatively affects the planet. The unit emphasizes the importance of reducing food waste and encourages pupils to identify and implement practical solutions both in school and at home, such as creating "swap shops" for uneaten food or composting certain food remains. Through this, pupils develop an understanding of sustainability and their role in minimizing environmental harm.
Key Knowledge	• Food waste is edible food that is thrown away. • Most food waste goes to landfill sites, negatively impacting the planet. • Reducing food waste is important for the environment.
Enquiry Question	What is food waste and how can it be reduced?
Enquiry Type	Sustainability

Intended Learning

Lesson	**Learning Objective / National Curriculum link.**	**Skill Objective**	**Brief Overview**	**Key Vocabulary**	**Things to look out for**
1	**What is food waste?**	Working scientifically – Asking relevant questions and using different types of scientific enquiries to answer them.	In this small step, children look at food waste and the impacts of food waste on the planet. In the previous nutrition and diet block, children learnt that food can be sorted into different food groups and that different foods provide nutrients for the body. In this sustainability block, children look at how food waste has a negative impact on people and the planet. Children should understand simple	Food waste, landfill, edible, inedible, food waste recycling	Children may think that food waste has no impact on the planet.

			negative impacts of food waste and should be able to suggest ways they can reduce their food waste in school. Throughout this sustainability block, there are opportunities for children to work scientifically and practically to think of ways to reduce their food waste. What is food waste and how can it be reduced?		Children may think that "putting food in the bin" is the correct way to dispose of edible food. Children may not realise that food that is put in the bin ends up in landfill sites, which are harmful for planet Earth.
2	**How can we reduce our food waste?**	Working scientifically – Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.	In this small step, children build on their understanding of food waste and look at how they can reduce food waste in school. This step provides an opportunity for children to think of ways to reduce food waste, so less is sent to landfill. By the end of this sustainability block, children should understand that food waste has negative impacts on people and the planet. They should be able to understand that food that is thrown away often ends up in landfill, where it rots. They should identify simple ways of reducing food waste in school and at home. Children should be given the opportunity to suggest small changes within their school setting to reduce food waste, including implementing "swap shops" at break and lunch time, or creating an area where some food remains can be composted.	Food waste, landfill, edible, inedible, food waste recycling	Children may think that reducing their own food waste will have no impact globally. Children may think that "putting food in the rubbish bin" is the correct way to dispose of food and food remains.

Unit Summary	
Term	**Autumn (5 Lessons)**
Topic	**Chemistry: Rocks**

The Big Picture	In this unit, pupils study the different rock types and their properties. Pupils will learn to identify and categorize various rocks like granite, pumice, sandstone, chalk, marble, and gneiss based on their appearance and simple physical characteristics, such as whether they have crystals, grains, or layers. Through hands-on testing, they will explore properties like hardness, whether rocks float or sink, and how they react with acid. The unit culminates with pupils conducting a local rock survey to observe how rocks are used as building materials and how they change over time due to weathering.
Key Knowledge	• Rocks are natural materials with different properties, such as appearance, texture, hardness, and whether they float or sink. • Rocks can be identified and grouped by features like crystals, grains, or layers. • Rocks change over time due through a process called weathering.
Enquiry Question	How can rocks be identified and grouped based on their properties?
Enquiry Type	Identifying, grouping and classifying

Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**Identify rocks** Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.	Working scientifically – Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.	In Years 1 and 2, children looked at rocks as a type of material. They used the terms “rock”, “stone” and “pebble”, and they should recap the differences between these different forms of rock in this step. In this small step, children identify granite, pumice, sandstone, chalk, marble and gneiss. They should use hand lenses to observe these rocks closely and note any similarities and differences between them. These rocks are examples of metamorphic, sedimentary and igneous rock. In Key Stage 2, children do not need to use these terms to describe rocks, nor do they need to understand how these rocks are formed, because this topic is introduced later in the curriculum. In this step, children begin an identifying, grouping and classifying enquiry to group rocks based on their simple properties. Practical activities such as observing actual rocks, will allow children to describe their properties. Children are introduced to the enquiry question - How can rocks be identified and grouped based on their properties?	Granite, pumice, sandstone, chalk, marble, gneiss	Children may think that all rocks are heavy. Children may think that all rocks are hard.
2	**Group rocks** Compare and group together different kinds	Working scientifically – Talk about criteria for grouping, sorting and	In this small step, children group rocks in different ways, based on their simple physical appearance. Children should understand that different rocks have crystals, grains or layers, and that they can use these properties to	Crystals, grains, textures, layers	Children may think that all rocks are the same. Allow children to

	of rocks on the basis of their appearance and simple physical properties.	classifying (non-statutory).	sort rocks into different groups. In Year 3, children should understand that rocks can be grouped in more than one way and they can choose their own categories for grouping. They could begin by sorting rocks into two pre-decided groups such as “hard rocks” and “soft rocks” before choosing their own categories for grouping later in the step. Children do not need to sort the rocks into metamorphic, sedimentary and igneous rock. This step continues with an identifying, grouping and classifying enquiry to group rocks based on their simple properties.		use hand lenses to observe crystals, grains and layers closely.
3	**Test rocks** Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.	Working scientifically − Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.	In this small step, children continue to work on the enquiry question. They perform simple tests on rocks to learn more about their different properties. Children test granite, pumice, sandstone, chalk, marble and gneiss to further their understanding of rocks. Children begin by using an iron nail to test the rocks for hardness. Ensure they are aware that the nail can cause damage to themselves or others if used incorrectly. They should then test to see whether the rocks float or sink. Children are then introduced to the idea of “a reaction” using vinegar dropped onto the rocks. They should understand that vinegar is acidic and that acid can cause a reaction on some rocks and not others. A “reaction” at this stage is simply described as “a change”. This can be seen with a temperature change, bubbles or a colour change.	Hardness, float, sink, brittle, reaction	Children may think that all rocks are hard and cannot break easily. Children may think that all rocks are heavy and therefore will sink.
4	**Local rock survey** Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.	Working scientifically − Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.	In this small step, children conduct a survey around their local area to identify rocks and observe where they are used for building materials. Children choose a building or structure to study. They should use their understanding of rocks to predict which rock type it is made from. They can then use hand lenses to observe the rock more closely and make accurate observations. If possible, guide children to specific structures that are built with the rock types they have learnt about. Be prepared to explain that they may also see many other rock types. Children explore how rocks have changed over time through weathering. They can observe this easily in graveyards, where older gravestones are more weathered than newer ones. Children should be given the opportunity to form an answer to the enquiry question within this step.	Crystals, grains, textures, layers, weathering	Children may think that only large buildings are made from rocks. Gravestones, cobbles, walls, tiles and stairs are also examples of structures made from different rock types.

Unit Summary	
Term	**Spring (2 Lessons)**
Topic	**Chemistry: Fossils**
The Big Picture	In this unit, pupils are introduced to the concept of fossils and the process of fossilisation. Pupils will learn that fossils are the remains or traces of ancient living things, including both animals and plants, and that they are crucial for scientists to understand past life. The unit specifically delves into how fossils are formed over thousands of years when the hard parts of dead organisms are buried by layers of sediment that eventually turn into rock, with minerals replacing the original material. Pupils will explore and model this rare and specific process, understanding the conditions necessary for fossilisation to occur.
Key Knowledge	• Fossils are the remains or traces of living things from a very long time ago. • Both animals and plants can become fossils, usually from their hard parts like bones or shells. • Fossilisation is a rare process where remains are buried by sediment and turn into rock over thousands of years. • Fossils help scientists understand past life on Earth.
Enquiry Question	How are fossils formed?
Enquiry Type	Research

Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**Explore fossils** Describe in simple terms how fossils are formed when things that have lived are trapped within rock.	Working scientifically – Asking relevant questions and using different types of scientific enquiries to answer them.	In the previous block, children learnt about different types of rock and had opportunities to group and test them. In this small step, children build on this knowledge to explore fossils. A fossil is described as the remains or trace of a living thing that lived a long time ago. Fossils have led scientists to discover important information about living things from the past, such as dinosaurs. Children should understand that fossils are usually formed from the shells or bones of living things, but can also be formed from animal tracks and footprints. Children should be given opportunities to observe replicas of fossils, as well as pictures, to allow them to group fossils and describe their features. Additionally, children could suggest what animals and plants in the past may have looked like and compare this to modern-day animals and plants. In this step, children begin a research enquiry to explore how fossils are formed.	Fossil, rock, skeleton, shell	Children may think that only the remains of animals can become fossils. Children may think that a fossil can be formed in a short period of time. Explain that it takes thousands of years for a fossil to form.

2	**Fossil formation** Describe in simple terms how fossils are formed when things that have lived are trapped within rock.	Working scientifically – Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.	In this small step, explore the process of fossilisation. Children should understand that fossilisation is a rare process and will only happen under certain conditions. Usually, fossilisation occurs when an animal dies in a watery environment and is buried in mud. By the end of this step, children should understand that after an animal dies, the soft parts of the animal's body break down, leaving behind the hard parts, such as the skeleton and teeth. The hard parts become buried by sediment. Sediment contains soil, sand, gravel and small pieces of rock. Over time, many layers of sediment build up on top of the skeleton, which leads to a lot of pressure. Eventually, sediment surrounding the skeleton begins to compact and turn to rock. Water seeps into the rock, causing the bones to break down and be replaced by minerals in the water. This leads to the formation of a fossil, which is a rock replica of the original bones or teeth.	Fossilisation, rock, skeleton, fossil, sediment	Children may think that fossilisation always occurs when an animal or plant dies. Explain that it is a very rare process that only happens under certain conditions.

Unit Summary	
Term	**Spring (5 Lessons)**
Topic	**Chemistry: Soil**
The Big Picture	In this unit, pupils are introduced to the composition, types, and importance of soil. Pupils will explore various soil types, such as sandy, clay, peat, and chalky, learning what they are made of (small rocks, organic matter, and water) and their distinct properties. They will investigate the vital role soil plays in supporting life, providing nutrients for plants, acting as habitats for animals, and preventing flooding. A core element of the unit involves pupils planning, conducting, and evaluating a comparative experiment to determine which type of soil absorbs the most water, thereby developing their scientific enquiry skills.
Key Knowledge	• Soil is a mixture of small rocks, organic matter, and water. • There are various types of soil, such as sandy, clay, peat, and chalky, each with different properties. • Soil is crucial for life, providing nutrients for plants and habitats for animals, and helping to absorb water. • Different types of soil have varying abilities to absorb water.
Enquiry Question	Which soil absorbs the most water?
Enquiry Type	Comparative test
Intended Learning	

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**Explore soil** Recognise that soils are made from rocks and organic matter.	Working scientifically – Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables	In this small step, children explore different types of soil and what they are made up of. It is important to note that children have not studied soil before. As a result, they may have a limited understanding of the key terms and the various types of soil. Children should have opportunities to explore different types of soil, such as sandy, clay, peat and chalky soils. They can undertake simple practical activities such as closely observing the soils using hand lenses and drawing what is seen, sieving the soils to separate the larger and smaller matter and adding water to the soil to see if any parts float or sink. Testing different types of soil will allow children to describe their features and compare them.	Soil, sandy soil, clay soil, peat soil, chalky soil, organic matter	Children may think soil is just “mud” or “dirt”. Clarify to them that soil is a complex mixture of small rocks, organic matter (remains of dead animals and plants) and water. Children may think that animals cannot live in soil. Discuss animals that do live in soil, such as worms.
2	**The importance of soil** Recognise that soils are made from rocks and organic matter.	Working scientifically – Using straightforward scientific evidence to answer questions or to support their findings.	In this small step, children learn about the importance of soil. This includes why many living things need soil to survive. It is important that children are aware of the importance of soil to both animals and plants. This includes providing nutrients and water for plants and habitats for many animals. Children should have opportunities to research the importance of soil and ask relevant questions of their peers and adults to further their understanding. There is also an opportunity within this step for children to learn about how human activities such as deforestation and construction work may cause soil loss and the impact this has on both animals and plants. Children will explore the enquiry question How has human activity caused soil loss and what is the impact on living things?	Soil, nutrients, habitat loss, deforestation, habitat	Children may think that only plants benefit from soil and animals do not. Highlight to them that many animals depend on soil and that it provides habitats for animals, such as worms and insects. Children may think that the loss of soil from human activity only has an impact on animals and plants. Clarify to them that soil absorbs lots of water and if soil

					loss occurs due to human activity, then flooding may increase, which can impact humans.
3	**Plan – soil experiment** Recognise that soils are made from rocks and organic matter.	Working scientifically – Setting up simple practical enquiries, comparative and fair tests.	In this small step, children plan a comparative test to explore the absorbency of different soils. Children test four different soils to see if they retain the same volume of water. Children use filter funnels, measuring cylinders and filter paper. They add the same mass of soil and volume of water to each soil sample. They should then record how much water passes through the soil and filter paper into the measuring cylinder below. Encourage them to use a plan proforma in small groups for support in making a prediction and creating a logical experiment plan. Children in Year 3 do not need to be specifically aware of the terms independent, dependent and controlled variables. However, they should be able to identify what they will change, measure and keep the same in the experiment. Children will explore the enquiry question Which soil absorbs the most water?	Independent variable, dependent variable, controlled variable	Children may confuse the variables in this experiment. Highlight and make clear to them what will be changed, measured and kept the same. Children may struggle to measure the amount of water that enters the measuring cylinder after it has passed through the soil and may need further support with this skill.
4	**Investigate – soil experiment** Recognise that soils are made from rocks and organic matter.	Working scientifically – Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.	In this small step, children carry out a comparative test to explore which type of soil absorbs the most water. They should use their plans from the previous step to set up practical equipment and make careful observations throughout. When undertaking this experiment, it is important that children measure the mass of the soil correctly. In addition, they also need to correctly measure the amount of water that enters the measuring cylinder. By the end of this step, children should compare the amount of water absorbed by different types of soil	Soil, filter paper, filter funnel, measuring cylinder	Children may struggle to correctly fold the filter paper and place it in the filter funnel. You may need to demonstrate this skill prior to the investigation. Children may need support with measuring the mass of soil and the volume of

					water. These skills may need modelling to children before they complete their experiment.
5	**Evaluate – soil experiment** Recognise that soils are made from rocks and organic matter.	Working scientifically – Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.	In this small step, children evaluate their soil experiment. They should work scientifically to analyse data, make conclusions and evaluate their experiment. Within this step, children should be given the opportunity to answer the enquiry question. This is the first-time children have evaluated an experiment and therefore modelling how to write a written evaluation is essential. They should also be encouraged to think of some relevant questions for further investigations linked to soil. Children could compare their data or results to other groups to allow them to spot patterns and whether their results are similar or different. They should also be given opportunities to reflect on their experiment and then discuss how any improvements could be made.	Soil, absorb, conclusion, evaluation, data	Children may struggle to think of ways to improve their experiment and may state that by working with another group, their results would improve. Highlight to them that they must think of scientific ways to improve their experiment.

Unit Summary	
Term	**Spring (8 Lessons)**
Topic	**Physics: Light**
The Big Picture	In this unit, pupils explore the fundamental concepts of light and shadows. Pupils will learn about various light sources, distinguishing between natural and artificial light, and understanding the beneficial and harmful aspects of the Sun's light, along with ways to protect their eyes. They will also investigate how we see objects, learning that light reflects off surfaces and enters our eyes. A key part of the unit focuses on shadows, including how they are formed when an opaque object blocks light, and classifying materials as opaque, translucent, or transparent based on how much light passes through them. The unit culminates in pupils planning, investigating, and evaluating an experiment to determine how the distance between a light source and an object affects the size of the shadow.
Key Knowledge	• Light comes from natural (like the Sun) and artificial sources. • We see objects when light reflects off them into our eyes. • Shadows are formed when an opaque object blocks light. • Materials can be opaque (block light), translucent (let some light through), or transparent (let all light through). • The distance between a light source and an object changes the size of its shadow.
Enquiry Question	How does the distance between the light source and the object affect the size of a shadow?

Enquiry Type	Fair test				
Intended Learning					
Lesson	**Learning Objective / National Curriculum link.**	**Skill Objective**	**Brief Overview**	**Key Vocabulary**	**Things to look out for**
1	**Light sources** Recognise that they need light in order to see things and that dark is the absence of light.	Working scientifically – Identifying differences, similarities or changes related to simple scientific ideas and processes.	In this small step, children learn about sources of light. This is the first time that children have explored light and therefore they may have some common misconceptions about light and how it is produced. In this step, children explore the difference between natural and artificial sources of light. They should be given opportunities to sort and group different light sources based on these two categories. By the end of this step, children should give examples of natural light sources, such as the Sun and stars. Children may be more familiar with examples of artificial light sources, including torches, street lights, mobile phones and televisions. Children do not need to look at the dangers of the light produced by the Sun in this step, as this is covered in Step 2	Light, eyes, light sources, natural light, artificial light	As we see with our eyes, children may think that our eyes produce light, rather than light is reflected into our eyes allowing us to see. Children may think that the Moon is a source of light as it can be seen in the night sky.
2	**The Sun** Recognise that light from the Sun can be dangerous and that there are ways to protect their eyes.	Working scientifically – Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.	In this small step, children learn about some of the harmful effects of the Sun and explore ways to protect their eyes from the Sun's rays. It is important that children are aware of how to keep safe in the Sun and they should understand that they should never look directly into the Sun. They should also explore the different ways that they can keep their eyes safe during daylight hours. Link this step to real-life contexts as much as possible by using scenarios such as "going to the beach" or "a trip to the park". Encourage children to think about appropriate materials to protect their bodies and eyes from the harmful effects of the Sun. To extend learning, children may also want to think about why humans do not need to protect their eyes from the Sun during the night. Children may have limited understanding about the Sun, therefore a discussion about its necessity for survival is essential within this step. Children should be aware that the Sun provides both heat and light to allow humans and other life to survive.	Sun, natural light sources, eyes, sunglasses, protect	Children may only recognise sunburn as a harmful effect of the Sun.
3	**How we see**	Working scientifically – Recording findings	In this small step, children learn about the eye and how we see. Children should understand that light travels in	Reflection, light sources, shiny, dull	As we see with our eyes, children

	Notice that light is reflected from surfaces.	using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.	straight lines. This can be modelled in the classroom using a torch beam on a surface. In Year 3, children only need to be able to simply explain how we are able to see objects. They should identify that we are able to see an object because light reflects off it, enters our eyes, and the brain processes this information. All everyday objects reflect light to some extent, but smooth, shiny surfaces (such as mirrors or polished metals) are better at reflecting light than others. In this step, children do not need to learn the names of the parts of the eye, as this is covered in Year 6		may think that our eyes produce light, rather than light is reflected into our eyes allowing us to see. Children may think that only shiny, smooth surfaces reflect light.
4	**Shadows** Recognise that shadows are formed when the light from a light source is blocked by an opaque object.	Working scientifically − Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.	In this small step, children explore the concept of shadows. Children have already looked at how we see objects but they may have some misconceptions around shadow formation. They should learn that a shadow is formed when light is blocked by an opaque object. In Key Stage 1, children used the terms “opaque”, “transparent” and “translucent” to describe different materials. They will examine what the terms mean in more depth in the next two steps. Within the classroom, provide children with a range of different activities to explore how changing the position of the light source from an object, and changing the object itself, can change the shadow formed. Children should recognise that the shape of the shadow is similar to the shape of the object. Later in the block, children will investigate what happens when the distance between a light source and an object changes.	Opaque, translucent, transparent, shadow	Children may think a shadow is a reflection of the Sun. Children may think a shadow can only be created by the Sun rather than by other light sources. Children may think that all materials cast shadows.
5	**Opaque, translucent or transparent?** Recognise that shadows are formed when the light from a light source is blocked by an opaque object.	Working scientifically − Asking relevant questions and using different types of scientific enquiries to answer them.	In the previous small step, children looked at the concept of shadow formation for the first time. They identified that shadows are formed when light from a light source is blocked by an object, creating an area of darkness where the light does not reach. They also used the terms “opaque”, “translucent” and “transparent” to describe different materials. In this small step, children build on their understanding of these terms and carry out a short investigation to explore these concepts further. Children initially identify whether objects are opaque, translucent or transparent before observing whether light is able to pass through these objects or not. Then they pick which objects cast the clearest and most defined shadows. They should identify that translucent objects do not form clear and defined shadows when a light source is shone at them, as	Opaque, translucent, transparent, shadow	Children may think that translucent objects would cast clear, defined shadows because they are not completely transparent.

			light can pass through, and that opaque materials form clear and defined shadows as light does not pass through them.		
6	**Plan – shadow experiment** Find patterns in the way that the size of shadows change.	Working scientifically − Setting up simple practical enquiries, comparative and fair tests.	In this small step, children plan a fair test to investigate how the distance between an object and a light source affects the size of the shadow it forms. They plan to explore whether an object closer to the light source, or further away, forms a larger shadow. This step introduces the enquiry question for this block. How does the distance between the light source and the object affect the size of a shadow? A discussion of the term “distance” is essential before planning this experiment. Children do not need to use the terms “independent”, “dependent” and “controlled variables”, but they should discuss what they will change, measure and keep the same. Children have looked at measuring in metres, centimetres and millimetres within maths, so a discussion of which unit of measurement is most appropriate for this investigation can be used as a reflection point to recap these concepts.	Independent variable, dependent variable, controlled variable	When choosing an object for this experiment, encourage children to choose an object that has a simple shape, such as a cube or block, rather than a complex outline such as a toy or figure.
7	**Investigate – shadow experiment** Find patterns in the way that the size of shadows change.	Working scientifically − Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.	In this small step, children carry out a fair test to explore how the distance from a light source affects the size of an object’s shadow. Children should be encouraged to set up practical equipment and make systematic and careful observations throughout. In Year 3, children may find it difficult to measure either the width or length of the shadow. To allow for a more accurate measurement, children may choose to stick A3 paper to a classroom wall during the experiment to allow them to draw around the shadow at each interval and then measure the shadow size from the drawn outline. When undertaking the experiment, try to minimise the amount of light within the classroom to ensure the shadow is as clear as possible.	Light source, opaque, shadow, distance	Children may struggle to maintain a consistent distance from the object to the wall. Place the object on a table to allow the object to remain in a consistent position. Ensure children are using the same object for each test to ensure they gather accurate data.
8	**Evaluate – shadow experiment** Find patterns in the way that the size of shadows change.	Working scientifically − Using results to draw simple conclusions, make predictions for new values, suggest	In this small step, children evaluate their shadow experiment. This is the second time within the Year 3 curriculum that children have looked at creating an evaluation for an experiment. Therefore, they may need help in this step, for example, by providing scaffolds for their evaluations. In this step, children should be given the	Shadow, opaque, conclusion, evaluation	Children may believe that by simply repeating the number of measurements, reliability of

		improvements and raise further questions.	opportunity to answer the enquiry question and discuss how the distance from a light source affects the size of the shadow. They should conclude that the closer an object is to a light source, the larger the shadow it produces. In Year 3, they should simply identify patterns in the size of the shadows. Why shadows change size due to light travelling in straight lines is explored in Year 6 In Year 3, children only need to draw simple conclusions based on how the size of shadows change due to the distance between the object and light source. Children should also provide an answer to the enquiry question.		results improves. However, if there are already errors in the investigation, repeating it will just generate more unreliable results.

Unit Summary	
Term	**Summer (10 Lessons)**
Topic	**Biology: Plants A**
The Big Picture	In this unit, pupils are introduced to the fundamental aspects of flowering plants, their structure, functions, growth, and life cycle. Pupils will explore the different parts of a plant (roots, stem, leaves, flowers) and their specific functions, conducting dissections to observe them first-hand. They will investigate the requirements for plant growth and understand how water is transported within plants. A significant portion of the unit focuses on the reproductive aspects of plants, including the processes of germination (seeds sprouting), pollination (transfer of pollen), and various methods of seed dispersal. The unit culminates in pupils understanding and being able to explain the full life cycle of a flowering plant.
Key Knowledge	• Pupils learn the parts of a plant (roots, stem, leaves, flowers) and their functions. • Water is absorbed by roots and transported through the stem to other parts of the plant. • Seeds germinate when they break their coating and send out roots/leaves. • Pollination is the transfer of pollen, leading to seed formation. • Seed dispersal (by wind, animals, water, or explosion) is essential for plant reproduction and spreading.
Enquiry Question	Does the number of seeds within one plant pot affect the growth of the plants?
Enquiry Type	Observation over time

Intended Learning

Lesson	**Learning Objective / National Curriculum link.**	**Skill Objective**	**Brief Overview**	**Key Vocabulary**	**Things to look out for**
1	**Parts of a plant and their functions**	Working scientifically – Using straightforward scientific evidence to	In this small step, children explore the different parts of a plant and their functions. In years 1 and 2, children observed and identified plant parts, such as roots, stem, leaves and flowers. In this step, children will recap the	Leaf, stem, roots, flower, soil	Children may think plants get their food from the soil or that plants

	Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.	answer questions or to support their findings.	parts of a flowering plant, then look at their functions and why they are important to the plant. In addition to learning the functions of the different plant parts, it is important to give children opportunities and activities to apply their knowledge. This could include a discussion on what could happen to a plant if the different parts were damaged or were not functioning properly.		eat food like animals do. Explain to them that green plants make their own food from sunlight. Children may think that the flowers do not have a specific function for the plant. Clarify to them that the flowers play an important role in helping plants to reproduce and create new life. This process of pollination will be explored later in the block.
2	**Plant dissection** Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.	Working scientifically − Talk about criteria for grouping, sorting and classifying (non-statutory).	In this small step, children apply their knowledge of plant parts from the previous step and complete a plant dissection. When dissecting, children should carefully cut and observe the different parts of a plant including the roots, leaves, stem and flowers. Children should have the opportunity to dissect a range of plants and identify the different parts and their functions. They can apply their knowledge of plant parts and note the differences in the structures between various plants. To extend learning, children can sort and group the structures in different ways. This could be by appearance or by making comparisons between the functions of different parts of the plant.	Leaf, stem, roots, flower, dissection	Children may think that the stems, leaves and flowers of different plants all look the same. Clarify to them that different plants will have different-sized stems, leaves and flowers, and will also have different appearances. Classroom scissors should be used to complete the dissection. Children should also wash their

					hands after handling plants.
3	**Plan – plant growth** Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant.	Working scientifically − Asking relevant questions and using different types of scientific enquiries to answer them.	In this small step, children plan an experiment to test whether the number of seeds in one plant pot affects the growth of the plants. Children should work in small groups to make a prediction and create a logical experiment plan. In Year 3, children do not need to be aware of the terms independent, dependent and controlled variables. However, they should be able to identify what is changed in the experiment, what is measured and what is kept the same. In the next step, children will plant their seeds, before revisiting their plants at regular intervals to observe plant growth. Children are introduced to the enquiry question Does the number of seeds within one plant pot affect the growth of the plants?	Independent variable, dependent variable, controlled variable	Children should be made aware that all the other conditions for growth, such as light, water and temperature will remain the same throughout the experiment. For this experiment, ensure that the seeds planted are the same type of plant. For example, if children choose to grow sunflowers, ensure that all the seeds planted are sunflowers.
4	**Plant – plant growth** Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant.	Working scientifically − Setting up simple practical enquiries, comparative and fair tests.	In this small step, children use their plans from the previous step to set up their equipment and carry out the plant growth experiment. They should work in pairs or groups, so they are able to share ideas and work together. Remind children what they are changing, what they are measuring and what they are keeping the same. When undertaking this experiment, it is important that children correctly measure the mass of soil and volume of water that they will use. By the end of this step, children will have planted their seeds. Later in the term, in Plants B, they can then measure the heights of the plants once they are fully grown.	Soil, scale, seeds, measuring cylinder	Children may struggle to use the scales properly when measuring the mass of soil, so they may need help with this. Clarify that the mass of soil is normally measured in grams (g). They may struggle to use a measuring cylinder when measuring the volume of water

					and they may need help with this. Clarify that the volume of water is normally measured in millilitres (ml).
5	**The stem and water transportation** Investigate the way in which water is transported within plants.	Working scientifically − Setting up simple practical enquiries, comparative and fair tests.	In this small step, children explore the stem and water transportation. In previous steps in this block, children learnt about the stem of a plant and its function. In this step, they learn how water is absorbed by the roots from the soil and how it travels up the stem into the leaves and flowers. It is important that children are given opportunities to apply their knowledge of water transportation in the stem. Practical ideas of how to explore this concept are highlighted on the next page. Whilst undertaking these practical activities, encourage children to discuss what would happen to a plant if water was not transported to its leaves and flowers.	Leaf, stem, roots, flower, water transportation	Children may think that the roots “suck” in the water. Clarify to them that the roots absorb the water. Children may think that plants take in water from the leaves or the flowers. Explain that the roots absorb water from the soil, which then travels to the stem. The stem then transports water to different parts of the plant, such as the flowers and leaves.
6	**Looking at seeds** Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	Working scientifically − Identifying differences, similarities or changes related to simple scientific ideas and processes.	In Year 2, children explored how seeds grow into plants under the correct conditions. In this small step, children learn about the process of “germination”. It is important that children undertake practical activities as much as possible, to further their understanding of seeds and the germination process. By the end of this step, children should be able to describe what seeds are and the conditions in which they germinate and grow best, with reference to both water and temperature.	Seeds, seedling, seed coat, germination	• Children may think that a seed and a seedling are the same thing. Clarify to them that a seed grows into a plant, but a seedling is a young plant that is not yet fully grown. Children may think that all seeds need soil to

					begin the germination process. Practical activities, such as growing a seed in a zip lock bag, will help them to understand that a seed needs water and a suitable temperature to germinate.
7	**Reproductive parts in plants** Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	Working scientifically − Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.	In this small step, children learn about the reproductive parts in flowering plants. They learn that the “stamen” is the male reproductive parts, and the “pistil” is the female reproductive parts. However, children do not need to be aware of the individual structures that make up the stamen and pistil as these will be covered in Year 5 By the end of this step, children should be able to identify and describe the flowers, petals, stamen and pistil. Knowledge and understanding of these parts will help children in their understanding of pollination and seed dispersal in later steps within this block.	Flower, petals, stamen, pollen, pistil, eggs, reproductive organs	Children do not need to use the terms “anther”, “filament”, “stigma”, “style” or “ovary” as these terms are introduced within the Year 5 small steps. If using real-life examples of plants in the classroom, be aware that the pollen of some flowering plants may stain surfaces, such as skin and clothes.
8	**Pollination** Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	Working scientifically − Use relevant scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences (non-statutory).	In this small step, children are introduced to the process of pollination. They learn that pollination involves the transfer of pollen grains from the male parts of a flower (stamen) to the female parts (pistil) of a flower. Children also learn that seeds are formed when pollen grains and eggs join together. This will help in their understanding of seed dispersal in the next step. This step lends itself to practical activities, such as modelling, which helps children visualise and understand the process of pollination. Children should also use this step to learn about different examples of pollinators such as bees, butterflies, birds and wasps.	Pollination, pollen, stamen, pistil, eggs, pollinators	Children may think that bees are the only pollinators. Explain that other animals, such as butterflies, hummingbirds and bats, are also pollinators.

					Children may think that flowers can only be pollinated by animals. Pollination can also occur when wind carries the pollen from the stamen to the pistil. Children learn more about this in the next step.
9	**Seed dispersal** Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	Working scientifically − Identifying differences, similarities or changes related to simple scientific ideas and processes	In this small step, children learn about seed dispersal. They learn what seed dispersal is and describe the different ways that it occurs. Seed dispersal can be through wind, animals, water or an “explosion” within the seed pod to disperse the seeds. Children should be given the opportunity to observe different types of seed and should be encouraged to link the seeds’ features to seed dispersal. Children should understand the importance of seed dispersal for allowing plants to spread out and grow, and to prevent plant overcrowding. Give children opportunities to provide verbal or written explanations on the importance of seed dispersal. To extend the learning, children could carry out simple investigations into the variables that make seeds well suited to a specific type of dispersal.	Wind dispersal, animal dispersal, water dispersal, explosion dispersal, seed dispersal	Children may be familiar with wind dispersal as they may have blown dandelion clocks. Ensure that they understand that there are other methods which allow seed dispersal. These include animals, water, and explosions within the seed pods.
10	**Life cycle of plants** Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	Working scientifically − Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.	In this small step, children use their knowledge of seeds, germination, reproductive parts, pollination and seed dispersal to learn about the life cycle of plants. The main stages of the life cycle for most plants are germination, growth, pollination, seed formation and seed dispersal. Children should be given the opportunity to research the stages of the life cycle of a plant and should explain why each stage is important. Children could then present and compare their work on the life cycle of plants with others in the class.	Seed, germination, pollination, seed dispersal, life cycle	Children may believe that only animals, including humans, go through a life cycle. Explain to children that as plants are living things, they also go through a life cycle. Some children may think that the life cycles of all plants take the

					same amount of time. Explain to them that some plants can go through a complete life cycle in a matter of weeks, while other plants may take months or even years.

Unit Summary	
Term	**Summer (4 Lessons)**
Topic	**Physics: Forces**
The Big Picture	In this unit, pupils are introduced to the fundamental concepts of pushes and pulls. Pupils learn that forces are defined as a push or a pull, and specifically explore "contact forces" where objects must be touching. A significant focus is placed on friction, understanding it as a contact force that opposes movement, and recognizing that rough surfaces create more friction, while smooth surfaces create less. The unit culminates in pupils planning and conducting a scientific investigation to compare how different surface materials affect the distance a toy car travels down a ramp, allowing them to draw conclusions about the impact of friction.
Key Knowledge	• Forces are defined as a push or a pull. • A "contact force" occurs when objects are touching. • Friction is a contact force that pushes against a moving object. • Rough surfaces cause more friction, slowing objects down; smooth surfaces cause less friction, allowing objects to move further.
Enquiry Question	How does the material on a ramp affect the distance a car travels?
Enquiry Type	Pattern seeking

Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**Explore forces**	Working scientifically – Identifying differences, similarities or changes related to simple	In Year 2, children looked at changing the shape of some objects through squashing, twisting, bending and stretching. In this small step, children are introduced to forces for the first time. Children should define forces	Push, pull, force, contact force	Children may believe that only one force can act on an object at

	Compare how things move on different surfaces.	scientific ideas and processes.	simply as a push or a pull. Give them opportunities to observe push and pull forces in action. Effective ways to demonstrate pull forces include pulling a door or pulling a string to open a blind. Pushing a door closed or kicking a ball are effective ways to demonstrate push forces. Children should categorise examples of a force as a push or pull and be given the opportunity to exert forces themselves. To prepare children for investigating magnetism in Block 3, it is important to introduce push and pull forces as “contact forces”. By the end of this step, children should be able to define forces as a push or pull, stating that the forces observed are contact forces, because they affect objects which are touching.		once. Demonstrate pushing and pulling on an object at the same time, to show this in a simple way.
2	**Friction** Compare how things move on different surfaces.	Working scientifically – Using straightforward scientific evidence to answer questions or to support their findings.	In this small step, children build on their understanding of forces from Step 1 to explore friction. Children should recall that forces are pushes and pulls, and a contact force affects objects that are touching. Friction should be introduced as a contact force which pushes against a moving object. To demonstrate that friction works in the opposite direction to the moving object, show objects stopping slowly on a smooth surface and stopping quickly on a rough surface. Images such as slipping on a wet floor, ice skating and rolling a ball across gravel would help children to add context to their understanding. Children explore this concept further later in the block where they conduct an investigation to test whether the material on the ramp affects the distance a car travels.	Force, friction, contact force, smooth, rough	As children cannot see forces, they may find it difficult to understand their effects. Demonstrate this concept using practical examples as much as possible. Children may believe that a stationary object does not have any forces acting on it. Explain to them that friction can prevent an object from moving.
3	**Plan – friction experiment** Compare how things move on different surfaces.	Working scientifically − Setting up simple practical enquiries, comparative and fair tests.	In this small step, children use their understanding of forces to plan a comparative test. This test will look at how different materials affect the amount of friction between two objects. It would be useful to recap the definition of friction, to ensure that children make informed predictions. Children should be provided with a toy car, a rough material, a smooth material and a ramp. Carpet cut-offs and sandpaper are useful materials to demonstrate a rough surface. The ramp can act as the smooth surface. Children are not expected to use the terms “variables” in Year 3, but should identify what is changing, what is being	Independent variable, dependent variable, controlled variable	Children may struggle to set up their equipment. It could be useful to model how to do this, after they have discussed their plans. This extra support would help to provide context

			measured and what is kept the same. Children will explore the enquiry question How does the material on the ramp affect the distance a car travels?		when identifying what they are changing, measuring and keeping the same. Ensure that the toy car travels in a straight line and does not travel in a curve or angle before testing as this could affect their results.
4	**Investigate – friction experiment** Compare how things move on different surfaces.	Working scientifically − Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.	In this small step, children investigate how different materials affect friction, by releasing a toy car from the top of a small ramp and measuring how far it travels on each material. Provide them with at least two different materials to allow them to make comparisons. Ensure that the provided materials match those that were selected in the previous step. By the end of this step, children should provide an answer to the enquiry question. They should be able to identify that an object moves further on a smooth surface, because there is less friction between the object and the surface. An object will move less far on a rough surface, due to more friction between the object and the surface.	Force, friction, contact force, data, prediction	The height of the ramp and the way the car is released can affect the distance that the car travels. Before the investigation, decide the most suitable height of the ramp and the most appropriate measuring equipment to use. Encourage children to release the car at the top of the ramp rather than pushing it as this will affect the results of their investigation.

Unit Summary	
Term	**Summer (4 Lessons)**
Topic	**Physics: Magnets**

The Big Picture	In this unit, pupils are introduced to magnetic forces and how they work. Pupils learn that magnetism is a non-contact force, meaning it can act at a distance, unlike most other forces they have previously explored. They investigate different types of magnets and discover that magnets have two poles—north and south—which can attract or repel depending on their orientation. Pupils test various materials to find out which are magnetic and explore the misconception that all metals are magnetic, learning that only certain metals like iron and steel are. Through hands-on investigations, they also learn how magnetic poles interact, predicting and observing whether magnets attract or repel based on the poles facing each other. This unit builds observation and prediction skills while giving pupils a solid understanding of how magnets work and how they are used in everyday life.
Key Knowledge	• Magnetic forces are non-contact forces that can attract some materials. • Magnets have two poles: north and south; opposite poles attract, same poles repel. • Only some metals, like iron and steel, are magnetic. • Magnets can attract magnetic materials and interact with other magnets.
Enquiry Question	Are all metals magnetic?
Enquiry Type	Pattern seeking

Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**Magnets** Notice that some forces need contact between 2 objects, but magnetic forces can act at a distance.	Working scientifically − Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.	In this small step, children explore magnets and non-contact force for the first time. Children should understand that magnets create a force when around other magnets or magnetic materials. They should also identify the north and south poles of a magnet. Children will be familiar with everyday magnets from home or play activities. You can provide some fridge magnets to add context to the topic. As a magnetic force cannot be seen, it is important children handle a range of simple magnets and observe how they interact with each other. In the previous block, children explored contact forces. Using magnets allows them to observe that magnetism is a non-contact force, as the objects involved are not touching. When exploring the uses of magnets, avoid abstract examples. Good examples to use are magnetic doors to buildings, fridge doors and separating rubbish in a scrap yard.	Magnetic, magnet, poles, iron, magnetic force	Children may find magnets and magnetic forces difficult to understand as magnetic forces cannot be seen. Children may find it difficult to understand that disc and ring magnets also have north and south poles.
2	**Magnetic and non-magnetic materials** Compare and group together a variety of	Working scientifically − Identifying differences, similarities or changes related to simple	In this small step, children continue to explore the concept of magnetic forces. They explored magnets and non-contact forces in the previous step, and will develop this further in this step. Children will test different materials, both metals and non-metals, to see if they are magnetic	Magnetic, metal, no-metal, attract, magnet	Children may conclude that all metals are magnetic after testing them,

	everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials.	scientific ideas and processes.	or non-magnetic. This step links to learning from Year 1 and Year 2 where children explored the properties of materials. Children should make predictions before testing the materials. Materials should be sorted and grouped based on whether they are attracted by a magnet or not. Children should not test to see whether all metals are magnetic as this concept is explored within the next step.		which is not the case. This is explored further in the next step. Children may think that some magnets, such as disc magnets, only have one pole. All magnets have two poles. When testing to see if a material is magnetic, it does not matter which pole is used.
3	**Investigate metals** Observe how magnets attract or repel each other and attract some materials and not others.	Working scientifically − Setting up simple practical enquiries, comparative and fair tests.	In the previous step, children looked at which materials are magnetic or not. This is extended in this step by completing a pattern seeking enquiry into “Are all metals magnetic?”. Children may have concluded that all metals are magnetic, which is not the case. This misconception should be addressed in this small step. Provide children with metallic objects that are both magnetic and non-magnetic. Many household items may be suitable for this investigation. Magnetic metals include iron, steel (which is mostly iron) and nickel. Children should conclude that some metals are magnetic and some metals are non-magnetic. Children do not need to know the names of all the different metals, but you could introduce some key ones such as iron, steel and aluminium.	Magnet, metal, steel, iron, aluminium	Children may predict that all metals are magnetic. However, this is not the case. Children may think that all coins are magnetic. Clarify to them that depending on their composition, some coins are magnetic and other coins are non-magnetic. Since January 2012 the compositions of 5p and 10p coins have been made from a plated steel, making them magnetic.
4	**North and south poles – attract and repel**	Working scientifically − Reporting on findings from enquiries,	In this small step, children develop their understanding of magnets and their poles from Step 1. Children now explore how magnets attract or repel each other based on	Poles, magnetic, magnet, attract, repel	Children should be aware that disc and ring magnets

	Describe magnets as having 2 poles and predict whether 2 magnets will attract or repel each other, depending on which poles are facing.	including oral and written explanations, displays or presentations of results and conclusions.	the position of the poles. Children should identify the north and south poles on magnets. Children should use the terms “attract” and “repel” when making observations throughout this step. By the end of this step, children should identify that north and south poles on a magnet attract each other and north and north or south and south repel. They should make simple predictions on whether two magnets would attract or repel based on the position of the poles. Ensure children are aware that magnets can attract magnetic materials and other magnets, but repulsion only occurs between magnets.		also have north and south poles which attract and repel another magnet. Provide a range of magnet types to address this misconception. Children may think magnets have to be the same type to attract each other, for example two bar magnets.

Unit Summary	
Term	**Summer (1 Lesson)**
Topic	**Biology: Plants B**
The Big Picture	In this unit, pupils revisit an experiment from an earlier block where they planted different numbers of seeds in separate pots to explore whether the number of seeds affects how well plants grow. They take careful measurements in centimetres and millimetres to record plant heights and use this data to draw simple conclusions. Pupils learn that plants need air, light, water, nutrients from soil, and space to grow properly. They discover that too many seeds in one pot can limit growth due to competition for resources. This unit helps pupils build skills in scientific enquiry, measurement, and data interpretation while deepening their understanding of how plants grow.
Key Knowledge	• Plants need air, light, water, nutrients from soil, and space to grow. • Too many seeds in one pot can reduce plant growth due to competition. • Measuring plant growth helps us understand how different conditions affect it.
Enquiry Question	Does the number of seeds within one plant pot affect the growth of the plants?
Enquiry Type	Observation over time
Intended Learning	

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**Findings – plant growth** Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant.	Working scientifically – Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.	In this small step, children revisit their plant growth experiment from summer Block 1. Children have planted a different number of seeds in individual plant pots in order to investigate whether the number of seeds in one plant pot affects the growth of plants. Does the number of seeds within one plant pot affect the growth of the plants? Children made simple observations during the initial growth of the seeds. Children should use this step as an opportunity to practise taking accurate measurements in centimetres and millimetres. By the end of this step, children should provide an answer to the enquiry question. They should recognise that planting fewer seeds in a pot allows more space for growth as there is less competition for water, nutrients and light.	Soil, seed, measure, data	Children may need support with measuring in millimetres (mm). If all the seeds have grown, children may think that space has no effect on plant growth. Explain to children that plants need space to grow so they have access to more nutrients from the soil and so they can develop healthy root systems.

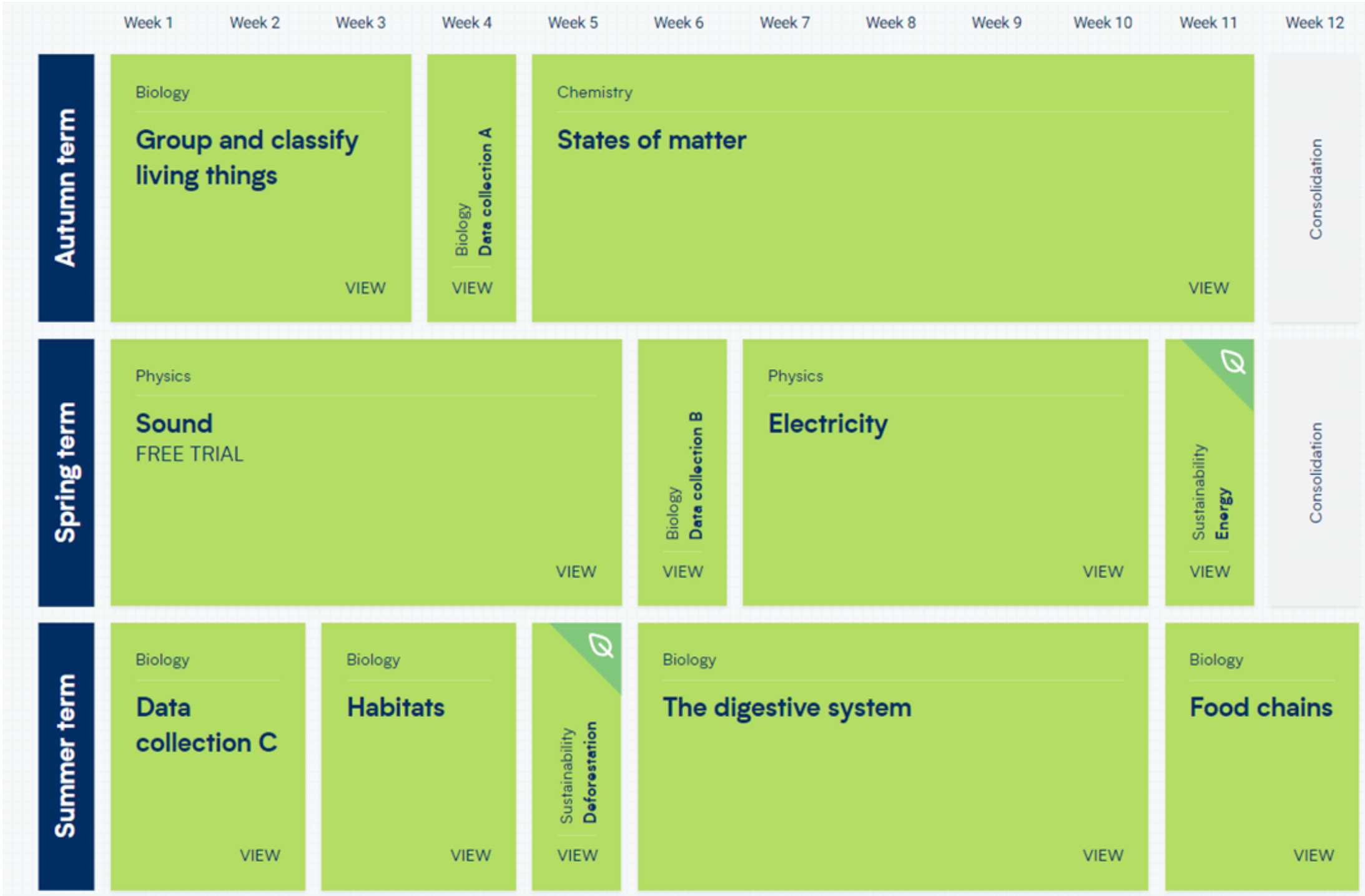
Unit Summary	
Term	**Summer (2 Lessons)**
Topic	**Sustainability: Biodiversity**
The Big Picture	In this unit, pupils learn how humans can affect biodiversity in both good and bad ways. Children explore their local area to find out how many different plants and animals live there and learn that biodiversity can change over time. They also learn about endangered and extinct animals and how this can happen when habitats are damaged. In the second part of the unit, children find ways to help nature, like planting trees, spreading wildflower seeds, or leaving areas of grass uncut. These actions, called rewilding, help more animals and plants live and grow in an area. The unit helps children understand that small changes can make a big difference to the environment.
Key Knowledge	• Biodiversity means the variety of living things in a habitat. • Human actions can increase or decrease biodiversity. • Animals can become endangered or extinct if their habitats are harmed. • Rewilding helps restore habitats and support more plant and animal life. • Simple actions like planting trees or wildflowers can improve local biodiversity.

Enquiry Question	What is biodiversity and how can we increase it?
Enquiry Type	Sustainability

Intended Learning					
Lesson	**Learning Objective / National Curriculum link.**	**Skill Objective**	**Brief Overview**	**Key Vocabulary**	**Things to look out for**
1	**What is biodiversity?**	Working scientifically – Asking relevant questions and using different types of scientific enquiries to answer them	In Key Stage 1, children learnt about different plants, animals and how their habitats provide everything they need to survive. This sustainability block builds on children's understanding by introducing the term "biodiversity". It is important that children understand how biodiversity can affect the range of different plants or animals that live within a habitat. In this small step, children learn that biodiversity is not fixed and can both increase and decrease. Children also learn how humans can have both a positive and a negative impact on the delicate balance of biodiversity. They look at examples of biodiversity being reduced by humans and the impact this has on plants and animals, such as a living thing becoming endangered or extinct. Children are introduced to the enquiry question What is biodiversity and how can we increase it?	Biodiversity, endangered, extinct, habitat, rewilding	Children may think that biodiversity within an area is fixed. Children may not see their area as being biodiverse. Encourage children to look for plant and animal life in microhabitats within the local area.
2	**How can we increase biodiversity in our local area?**	Working scientifically – Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.	In the previous small step, children learnt about biodiversity and defined it as the variety of animals and plants living in a habitat. They explored how biodiversity is not fixed and that through human activity, it can be increased or decreased. They investigated how humans can affect the biodiversity of an area. In this small step, children identify positive actions humans can take to increase biodiversity within their local area. Children should learn about rewilding projects and their benefits. It is important that they understand that while the changes they make might be small, promoting rewilding projects and increasing biodiversity will help support environments globally.	Biodiversity, endangered, extinct, habitat, rewilding	Children may not see their area as being biodiverse. Encourage children to look for animal and plant life in microhabitats within the local area. Children may believe that making small changes locally will have no impact globally.

Year 4

Autumn	Spring	Summer
Biology: Group and classify living things Biology: Data Collection A Chemistry: States of Matter	Physics: Sound Biology: Data Collection B Physics: Electricity Sustainability: Energy	Biology: Data Collection C Biology: Habitats Sustainability: Deforestation Biology: The Digestive System Biology: Food Chains


Week 1
Week 2
Week 3
Week 4
Week 5
Week 6
Week 7
Week 8
Week 9
Week 10
Week 11
Week 12
Autumn term
Biology
Group and classify living things
VIEW
Biology
Data collection A
VIEW
Chemistry
States of matter
VIEW
Consolidation
Spring term
Physics
Sound
FREE TRIAL
VIEW
Biology
Data collection B
VIEW
Physics
Electricity
VIEW
Sustainability
Energy
VIEW
Consolidation
Summer term
Biology
Data collection C
VIEW
Biology
Habitats
VIEW
Sustainability
Deforestation
VIEW
Biology
The digestive system
VIEW
Biology
Food chains
VIEW

Topic Context

Pupils begin the Autumn Term by looking at 'Grouping and classifying living things.' Building on knowledge from previous year groups, pupils will first group animals and plants before learning how to use classification keys effectively.

Throughout the year, pupils engage in three 'Data Collection' Blocks. These blocks specifically focus on Working Scientifically skills, providing pupils with opportunities to collect, record, and present data, for example, to identify living things in their local area.

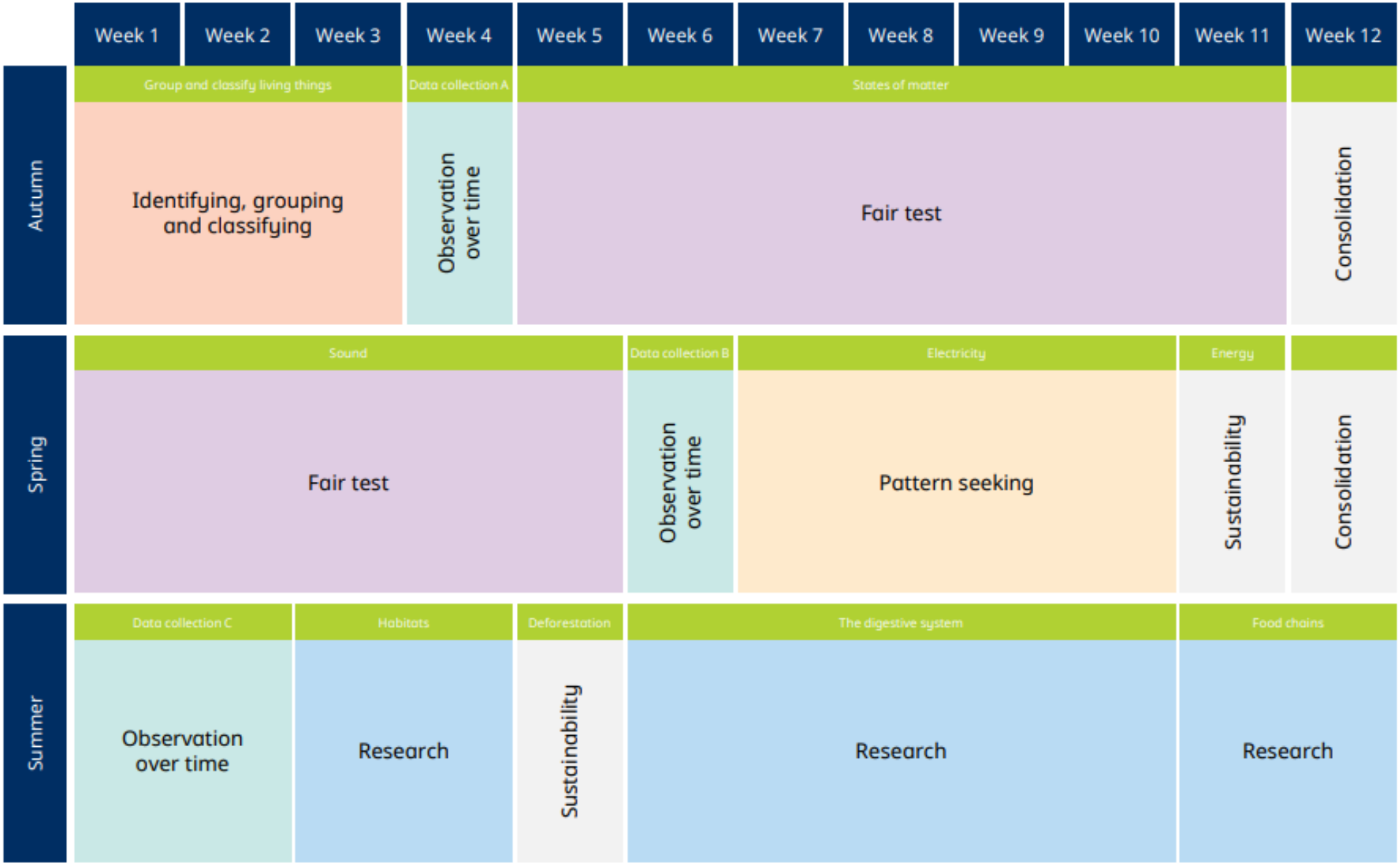
The 'States of Matter' block, a longer unit taught in the Autumn Term, allows pupils to apply their knowledge of solids, liquids, and gases. The 'Sound' Block in the Spring Term then builds on this foundation as pupils learn that sound can travel through all three states of matter: gases, solids, and liquids.

In the Summer Term, pupils use their understanding of living things to explore how humans impact animal 'Habitats,' examining both positive and negative effects.

Pupils also delve into 'The Digestive System' in the Summer Term. This block is taught later in the year due to the complexity of the language and concepts involved.

In the final block, 'Food Chains,' pupils can integrate their knowledge from both 'Habitats' and 'The Digestive System.' They will explore how the tooth structure of carnivores, herbivores, and omnivores indicates what an animal eats, and how a specific habitat provides everything an animal needs for survival.

Enquiry Types Mapped



Unit Summary	
Term	**Autumn (5 Lessons)**
Topic	**Biology: Grouping and classifying living things**
The Big Picture	In this unit, pupils explore how to group and classify living things, aligning with the National Curriculum aims. The unit progresses through five steps, beginning with grouping animals, where pupils learn to differentiate between vertebrates like mammals, birds, fish, amphibians, and reptiles based on their features. Next, pupils are introduced to invertebrates, such as insects, spiders, and soft-bodied invertebrates, and learn to classify them by observable characteristics. The unit then moves on to teaching pupils how to use and create classification keys, which are tools composed of "yes" or "no" questions, to accurately sort both animals and plants. Practical activities, outdoor learning, and the development of scientific enquiry skills are integrated throughout to foster a solid understanding of scientific processes and concepts.
Key Knowledge	• Pupils learn to group and classify a variety of living things, including both animals and plants. • They utilize classification keys, which employ closed (yes/no) questions, to help identify and sort organisms.
Enquiry Question	How can living things be grouped and classified?
Enquiry Type	Identifying, grouping and classifying

Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**Group animals** Recognise that living things can be grouped in a variety of ways.	Working scientifically – Talk about criteria for grouping, sorting and classifying (non-statutory).	In Year 2, children looked at animals (including humans) to identify their needs for survival, life cycles and offspring. They looked at examples of mammals, birds, fish, amphibians and reptiles. In this step, children identify and sort animals into groups based on their features. It is essential that children are confident with the definitions of each animal group because they will use this information to classify animals in later steps. Make it clear to children that all animals in this step have a spine. Children should be introduced to the term “vertebrate” to describe an animal with a spine. This is a building block for Step 2, in which they will look at invertebrates. Children should be shown examples of animals that are hard to categorise, such as the platypus, to challenge thinking and reasoning skills.	Mammals, birds, fish, reptiles, amphibians, vertebrate	Children may incorrectly group animals. For example, they may classify a whale as a fish because it lives in water. Discuss examples of animals that are harder to categorise before children carry out grouping activities.

2	**Vertebrates and invertebrates** Recognise that living things can be grouped in a variety of ways.	Working scientifically – Asking relevant questions and using different types of scientific enquiries to answer them.	In Step 1, children used the term “vertebrate” to describe an animal with a spine. In this step, children are introduced to the term “invertebrate” to describe an animal without a spine. Children identify and name familiar animals from insect, spider and soft-bodied invertebrate groups. Children group animals based on easily identifiable features. The enquiry question for this block is introduced in this step. How can living things be grouped and classified? Children are completing an identifying, grouping and classifying enquiry. Children should use their understanding of vertebrates and invertebrates to begin grouping animals.	Vertebrate, invertebrate, exoskeleton, insect, spider, soft-bodied invertebrate	Children may incorrectly group worms and spiders as insects. They are classified in a different category of invertebrate. Children may think that all invertebrates have an exoskeleton. Children may think that all invertebrates move in the same way.
3	**Classification keys (animals)** Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.	Working scientifically – Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.	So far, children have sorted vertebrates and invertebrates into groups. In this small step, children are introduced to classification keys. These are sets of questions that help people to classify living things. In this step, children use simple keys to sort animals correctly. It is important that children have a clear understanding of the physical features of each animal group, because they will use this knowledge to create questions. Children should create closed questions that can be answered with either “yes” or “no”. They may need support with creating these questions. For example, the question “How furry is it?” would not help children to classify an animal. A better question would be, “Does it have fur?”. If further support is needed, generate a whole-class question bank, which children can then use when creating classification keys.	Vertebrate, invertebrate, insect, spider, soft-bodied invertebrate	Children may use questions that are based on opinion rather than factual knowledge when trying to classify. Children may create questions that are too broad and therefore do not help to classify. Model writing a broad question and also a specific question. Allow the children to

					discuss which example is more useful and why.
4	**Group plants** Recognise that living things can be grouped in a variety of ways	Working scientifically – Talk about criteria for grouping, sorting and classifying (non-statutory)	In KS1, children identified common wildflowers, garden plants and deciduous and evergreen trees. In this step, children build on this knowledge to group plants in different ways. By the end of this step, children should know that flowering plants produce flowers and fruit and non-flowering plants do not. This step lends itself to practical activities in which children can observe plants closely and group them based on different features. Initially, children may group plants based on categories such as colour or size. To extend learning, they can sort and group plants based on more complex categories such as their leaf structure. Allow children to continue to develop their answers to the enquiry question throughout this step. In Year 3, children used the term “stamen” to describe a male reproductive part in a plant, and “pistil” to describe a female part. They do not need to use the terms “anther”, “filament”, “ovule”, “ovary”, “stigma” and “style” until Year 5	flowering plant, non-flowering plant, stamen, pistil	Some children may think that only the fruit that they eat are fruits.
5	**Classification keys (plants)** Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.	Working scientifically – Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.	In this small step, children use classification keys to classify plants based on simple physical features. This step allows children to revisit the skills they learnt when classifying animals in Step 3 Children should now be more confident with using classification keys, but may still need support with generating succinct, closed questions. Model examples of open and closed questions so children can select the most appropriate questions for their classification key. In this step, children will provide an answer to the enquiry question. They may choose to show their findings in classification keys, presentations, or in simple written and verbal responses.	flowering plant, pollination, non-flowering plant, fern, moss	Children may think that plants are not living things. Children may create classification questions that are based on opinion rather than factual knowledge. Children may create questions that are too broad and

					therefore do not help to classify. Model writing a broad question and also a specific question. Allow the children to discuss which example is more useful and why.

Unit Summary	
Term	**Autumn (2 Lessons)**
Topic	**Biology: Data Collection A**
The Big Picture	In this unit, pupils will focus on a scientific enquiry through an observation over time. Pupils will identify and name living things in their local area, collecting data throughout the year to understand how seasonal changes influence plant and animal life. They will utilize their prior knowledge of plants and animals, and classification keys, to identify familiar organisms. The unit also involves analysing the collected data, with pupils presenting their findings using various methods such as pictograms, bar graphs, labelled diagrams, or data tables, and identifying patterns and trends to make predictions.
Key Knowledge	• Pupils learn to identify and name living things in their local environment. • They collect data over time to observe and understand seasonal changes in plant and animal life.
Enquiry Question	What living things do we have in our local area and how does this change over the year?
Enquiry Type	Observation over time

Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**Data collection A** Explore and use classification keys to help group, identify and name a variety of living things in their	Working scientifically – Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.	In this small step, children begin a scientific enquiry that is an observation over time enquiry. What living things do we have in our local area and how does this change over the year? They name and identify living things in their local area, collecting data throughout the year. This will help them understand how seasonal changes influence plant and animal life. They should use their knowledge of	Vertebrate, invertebrate, flowering plant, non-flowering plant	Children may struggle to identify unfamiliar plants in their local area. They could use knowledge from Block 1 or free

	local and wider environment.		plants and animals from Block 1 to help them identify familiar plants and animals. Children should collect and record data in autumn, spring and summer to see what the changes are over the year. Children should decide how to record the data. They should use classification keys to help them identify plants and animals.		apps that scan and identify plants and animals. Children may need to be reminded that invertebrates are animals and should be included in their data collection. Children may need to recap maths skills such as using tally marks accurately to record data.
2	**Analyse data** Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.	Working scientifically – Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.	In the previous step, children began an enquiry to identify living things in their local area. When they have completed this enquiry, they will have a deeper understanding of how seasonal changes influence plant and animal life. In this small step, children work scientifically to analyse the data they collected in Step 1. Children could present their data in pictograms, bar graphs, labelled diagrams or data tables. Children compare data and look for patterns and trends. They should identify their key findings and make predictions as to whether the data they collect in the spring will be similar or different. They could suggest reasons why.	Bar chart, pictogram, data, prediction	Children may need support with maths skills such as drawing pictograms and bar graphs. They may need these modelling before they complete their own examples. If children need further support with recording data, they could create a physical representation of a block diagram using cubes.

Unit Summary	
Term	**Autumn (10 Lessons)**

Topic	**Chemistry: States of Matter**
The Big Picture	In this unit, pupils are introduced to the three states of matter: solids, liquids, and gases. Pupils will explore the distinct properties of each state and investigate how materials can change from one state to another through processes such as melting, freezing, evaporation, and condensation. A key focus of the unit is understanding the water cycle and the significant roles evaporation and condensation play within it. Throughout the unit, pupils will engage in practical experiments, including those designed to investigate melting and evaporation, and will learn to evaluate their experimental findings and draw conclusions.
Key Knowledge	• Pupils can identify and describe the properties of solids, liquids, and gases. • Pupils understand how materials can change between states (melting, freezing, evaporating, condensing). • Pupils comprehend the water cycle and the roles of evaporation and condensation within it.
Enquiry Question	How does the temperature of the water affect the time it takes for ice to melt?
Enquiry Type	Fair test

Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**Explore solids, liquids and gases** Compare and group materials together, according to whether they are solids, liquids or gases.	Working scientifically – Talk about criteria for grouping, sorting and classifying (non-statutory).	In this small step, children learn that materials and objects can be grouped into solids, liquids and gases. They look at the properties of solids, liquids and gases and relate these to the common uses of materials. Children also explore the similarities and differences between solids, liquids and gases. Children learn that solids have a defined shape and a fixed volume. They should understand that a solid material will keep its shape if it is transferred from one container to another. Children learn that a liquid keeps the same volume when it is poured into a different container. They also learn that a gas moves to fill any space available, so it will move in and out of open windows and can move around the room.	Solid, liquid, gas, states of matter, volume	Children may think that solid materials cannot change shape. Some solid materials can be squashed, bent, twisted or stretched. Children may think that the volume of a liquid changes when it is poured into different containers. Children may think that all solid materials are heavy.

2	**Think differently – solids, liquids and gases** Compare and group materials together, according to whether they are solids, liquids or gases.	Working scientifically – Identifying differences, similarities or changes related to simple scientific ideas.	In this small step, children explore materials that are more difficult to categorise, such as toothpaste, shaving foam and oobleck (a mixture of corn starch and water). This will challenge their thinking around how to categorise materials into each state of matter. Children should explore examples of materials that challenge their definitions of solids, liquids and gases. This includes solid materials that can be poured and liquids that flow slower than water, such as honey, oil and treacle. Children may use a sorting diagram to sort materials, as they could choose to group certain materials between a solid and a liquid for example.	Pouring solid, volume, oobleck, flow, states of matter	Children may think that it is only liquids that can be poured. Some solids, such as sand, sugar and rice, are solid materials that can be poured. Children may think that when a liquid flows slower than water, it is not a liquid. Oil and syrup are liquids that flow slower than water.
3	**Change states** Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C).	Working scientifically – Asking relevant questions and using different types of scientific enquiries to answer them.	In this small step, children build on their understanding of the states of matter and look at how some materials can change states between a solid, liquid and gas. The terms “evaporation” and “condensation” are introduced for the first time and these concepts will be built upon later in the block when children explore the water cycle. Children should see that temperature changes can cause changes in state. They should explore the concepts of melting and freezing through simple hands-on activities. This may be through observing an ice cube or piece of chocolate melt and through freezing different liquids.	Freezing, melting, boiling, condensation, evaporation	• Children may confuse boiling and evaporation. They may think that evaporation can occur only when water boils at 100°C. Children may think that once a material has melted it cannot turn back to a solid. Demonstrate that this process is reversible by melting and freezing an ice cube or a piece of chocolate.
4	**Use equipment** Observe that some materials change state when they are heated or	Working scientifically – Making systematic and careful observations and, where appropriate,	In this small step, children work scientifically to understand how to use a thermometer and a stopwatch accurately. This is so they can use these pieces of equipment within an experiment in the next two small steps. In maths in Year 2, children read scales on	Thermometer, beaker, temperature, stopwatch	Children may not read the scale on a thermometer accurately. Demonstrate to

	cooled, and measure or research the temperature at which this happens in degrees Celsius (°C).	taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.	thermometers. However, this will be the first time they are introduced to using a thermometer to take multiple readings of temperature. It is important that when children are measuring the temperature of hot water it is not above 50°C, to ensure health and safety guidelines are met.		them how to do this. Children may be confused with how to read the time on a stopwatch in minutes and seconds in digital time. If scientific thermometers are used, there may be some confusion if they have negative temperatures.
5	**Plan – melting experiment** Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C).	Working scientifically – Setting up simple practical enquiries, comparative and fair tests.	In this small step, children plan a fair test to investigate whether the temperature of the water affects the time it takes for ice to melt in it. This will be the first step in which they have planned a fair test within the Year 4 curriculum, so children will need to discuss variables before the experiment. Children do not need to use the terms "independent", "dependent" and "controlled variables" because these are introduced later in KS2. Instead, they can focus on what they are changing, measuring and keeping the same. Children may need to plan the experiment as a whole group to ensure that they all make a relevant prediction, discuss the variables involved and can explain how they will record their results.	Independent variable, dependent variable, controlled variable	Children may not convert minutes and seconds into seconds accurately. They may find it helpful to use a bar model.
6	**Investigate – melting experiment** Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C).	Working scientifically – Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.	In this small step, children carry out a fair test to investigate whether the temperature of the water affects the time it takes for ice to melt in it. This is the first step in which they have carried out a fair test in the Year 4 curriculum, so a discussion of variables before the practical experiment is essential. Children should set up practical equipment and make systematic and careful observations throughout the experiment. With support, children need to identify the relationship between temperatures and melting rates. It is important that the water cannot be over 50°C when children are measuring temperatures, to comply with health and safety guidelines.	Melting, thermometer, melting point, stopwatch	Children may struggle to take multiple accurate readings from a thermometer. When recording their results, children should put the units for temperature (°C) in the table heading and not

					next to every reading. Children may struggle to form a conclusion from their data.
7	**The water cycle** Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	Working scientifically – Identifying differences, similarities or changes related to simple scientific ideas and processes.	In this small step, children look at the water cycle. They build on their understanding of evaporation and condensation from previous steps and look at these processes as parts of the water cycle. Within this step, children learn that the water cycle began around four billion years ago. They should understand that water is recycled in the water cycle and no new water is made. In addition to this, they learn that water does not have to boil to turn into water vapour and that precipitation includes hail, sleet and snow. There are possibilities to look at the impact that climate change is having on the water cycle. As air temperatures increase, more water evaporates into the air. Warmer air can hold more water vapour, which can lead to more intense rainstorms and extreme flooding.	The water cycle, participation, atmosphere, evaporation, condensation	Children may think that the Sun absorbs water. Children may think that clouds are a gas (water vapour) and not water/ice droplets in the atmosphere. It is the water that makes clouds visible.
8	**Plan – evaporation experiment** Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	Working scientifically – Asking relevant questions and using different types of scientific enquiries to answer them.	In this small step, children plan an experiment to investigate whether the temperature of the air affects the time it takes for water to evaporate. They put the same volume of water in shallow dishes (such as Petri dishes) in three locations with different temperatures for example, in the fridge, in the classroom and on top of a radiator. This will allow children to make conclusions in the next step. Within this investigation, the most appropriate measure of time is hours, because minutes and seconds would be too quick to observe the process of evaporation.	Independent variable, dependent variable, controlled variable	Children may struggle to explain why the equipment they have been given is the most appropriate for the experiment. Children may think that evaporation will not occur in any conditions below 100°C.
9	**Investigate – evaporation experiment** Identify the part played by evaporation and condensation in the water cycle and	Working scientifically – Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using	In this small step, children carry out an experiment to explore whether temperature affects the rate of evaporation. They set up practical equipment and make systematic and careful observations throughout the experiment. Ensure that children know how to measure the volume of liquids and the temperatures of the different locations accurately. With support, children need to identify the relationship between higher temperatures and	Petri dish, observe, data, evaporation	Children may choose to use a large volume of water and fill the Petri dish. Choosing a smaller volume of water will allow

	associate the rate of evaporation with temperature.	a range of equipment, including thermometers and data loggers.	quicker rates of evaporation. When recording their data, children may choose to use statements to record how much water has evaporated over time or use numerical data with a scale, for example, 1 – all of the water has evaporated and 5 – the amount of water has remained the same.		children to observe the evaporation process more easily. Children may confuse the processes of boiling and evaporation. Explain to children that evaporation can occur at any temperature above 0°C.
10	**Evaluate – evaporation experiment** Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	Working scientifically – Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions	In this small step, children work scientifically to analyse data, make conclusions and evaluate their experiment. Children should use the evaluation sentence stems to structure their written analysis and evaluation. This is the first-time children have evaluated an experiment in Year 4. They may therefore they may need support to make conclusions using their data and to create an evaluation. Children could compare their data with other groups to allow them to spot patterns and identify anomalous results. In Year 4, children do not need to use the term "anomalous". However, they should be encouraged to spot any differences in data and discuss why these may have occurred. By the end of this step, children should be able to identify that higher temperatures increase the rate of evaporation.	Petri dish, temperate, data, conclusion	Children may think that temperature does not affect the rate of evaporation. Children may think that the water has "disappeared" from the container rather than evaporated.

Unit Summary	
Term	**Spring (10 Lessons)**
Topic	**Physics: Sound**
The Big Picture	In this unit, pupils are introduced to the fundamental concept that sounds are produced when objects vibrate, and these vibrations then travel through various mediums, including air, solids, and liquids, to our ears. Pupils will explore the structure of the ear and understand how its different parts enable us to detect these vibrations and interpret them as sounds. The unit also covers how the loudness, or volume, of a sound is measured in decibels (dB) using a decibel meter, and pupils will

	investigate different sound characteristics, including pitch (how high or low a sound is). A practical component of the unit involves pupils planning, conducting, and evaluating experiments related to sound volume.
Key Knowledge	• Sounds are made by vibrations. • Sound travels through different materials (like air, solids, and liquids) to reach our ears. • Our ears help us detect these vibrations and hear sounds. • The loudness of a sound is called volume, and it is measured in decibels (dB). • The pitch of a sound describes how high or low it is.
Enquiry Question	How does the distance from the sound source affect the volume of the sound?
Enquiry Type	Fair test

Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**Vibrations** Identify how sounds are made, associating some of them with something vibrating.	Working scientifically − Asking relevant questions and using different types of scientific enquiries to answer them.	In this small step, children learn that sounds are made when objects vibrate. This is the first time that children have explored sound and they may have some common misconceptions about sound and how it is produced. By the end of this step, children should understand that we hear sounds because an object vibrates. These vibrations then travel through the air (or another medium) to our ears. It is important that children are exposed to the different ways objects vibrate to produce sounds, including musical instruments, radios, mobile phones and animals. In the previous block, children explored the concept of solids, liquids and gases. It is important that children are aware that sounds can travel through air, but they can also travel through any material, including solids and liquids.	Vibration, ear, sound, volume, pitch	Children may think that sound only travels through air. They should be made aware that sound can travel through other mediums, such as solids, liquids and gases. Children could have a discussion around whether sound can be heard through walls or under water to address this.
2	**The ear** Recognise that vibrations from sounds travel through a medium to the ear.	Working scientifically − Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables	In this small step, children learn how sound reaches the ear and how the different parts of the ear allow us to hear sounds. This is the first time that children have explored the ear in detail. It is important that children are introduced to the main parts of the inner ear and the roles that they play in how sounds are heard. Children build on their understanding of vibrations to explore how the ear drum vibrates, which allows us to hear sounds. They can link this concept to their exploration of how sounds are made using musical instruments in the previous step. Within this step,	Outer ear, ear bones, ear drum, ear canal, cochlea	Children may find it difficult to understand how vibrations are detected by the ear. Show children how a drum skin vibrates to produce sound and link this to the ear drum in the middle ear.

			children learn that as well as detecting sounds, the inner ear also helps humans with their balance.		Children may find it difficult to understand how sounds travel through solids, liquids and gases. This is because vibrations cannot be seen, especially in the air.
3	**Investigate sounds** Identify how sounds are made, associating some of them with something vibrating.	Working scientifically − Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.	In this small step, children continue to explore sound and understand how the intensity of sound is measured. They learn that the intensity, or loudness, of sound is measured in decibels (dB). Within this step, children should record and measure sound levels over the day to see how the decibel levels increase and decrease. This could include recording the sound level in the classroom in comparison to the playground. Children should also be aware that prolonged exposure to loud sounds can potentially cause damage to the ears. There are opportunities to use data loggers or decibel meters to record an accurate measure of sound. If data loggers are not available, you can use sound apps as an alternative method for measuring sound levels throughout the day.	Sound, volume, vibration, decibel, decibel meter	Children may need support with measuring sound in decibels. If using data loggers or decibel meters, children will need to learn how to use them accurately, as this is the first time, they have used this equipment. Children have not yet been introduced to decimals; it is important that they record data from the decibel meters as whole numbers.
4	**Explore volume** Find patterns between the volume of a sound and the strength of the vibrations that produced it.	Working scientifically − Setting up simple practical enquiries, comparative and fair tests.	In this small step, children explore how the strength of the vibrations affects the volume of a sound. They should understand that, in general, louder sounds have bigger vibrations and quieter sounds have smaller vibrations. Children should explore the concept of volume using musical instruments. Instruments, such as drums and guitars, can be used to demonstrate how the volume of sound can be controlled by the way they are played. When a drum or guitar is played with greater force, the resulting sound is louder because the vibrations produced by the instrument are bigger. Children could also investigate the concept of sound insulation by experimenting with different materials to measure the reduction in sound volume using decibel meters.	Vibration, volume, insulate, decibel, decibel meter	Children may find it difficult to make the link between the strength of the vibrations and the volume of a sound. To clarify this, use rice on top of a drum skin to allow children to see if it is struck with a greater force, there is greater movement of the rice grains.
5	**Explore pitch**	Working scientifically − Identifying differences,	In this small step, children explore the term “pitch”. Children should understand that pitch refers to how high or low a sound is. They should look at a range of	Pitch, high-pitch, low-pitch, sound	Children may think that the pitch of an instrument can only be

	Find patterns between the pitch of a sound and features of the object that produced it.	similarities or changes related to simple scientific ideas and processes.	instruments and objects (such as elastic bands or different-sized pans) to explore how the pitch of the sound made by different objects can be changed. Children may find it difficult to differentiate between pitch and volume. Practical activities such as using instruments or listening to high and low-pitched sounds will help address this. Children also explore the simple shape of some sound waves and how they change with the pitch of the sound. They should understand that a sound with a higher pitch produces vibrations that are faster or more frequent. In contrast, sounds with a lower pitch have vibrations which are slower or less frequent.		changed in one way. Demonstrate to children that it can be changed in different ways using lengthening/shortening strings or using more or fewer fingers on holes in the instrument.
6	**Plan – volume experiment** Recognise that sounds get fainter as the distance from the sound source increases.	Working scientifically − Setting up simple practical enquiries, comparative and fair tests.	In this small step, children plan a fair test to explore whether distance has an effect on the volume of a sound. How does the distance from the sound source affect the volume of the sound? Within previous steps, children have recorded the volume of a sound in decibels (dB) using data loggers or sound apps. They should use this skill within this experiment. When undertaking this experiment, there must be a marked difference in the distances from the sound source, so that the results can show a trend. To produce valid results, the sound source must be the same volume throughout the investigation. A set sound, such as a recorded noise or a phone alarm, can be used to ensure consistency. A sound produced, for example, by hitting a drum may not have the same volume each time and therefore may provide inaccurate results. Children should be encouraged to create an experiment plan in small groups, so that they get support in making a prediction and creating a logical experiment plan.	Independent variables, dependent variables, controlled variables	Children should be aware that background noise can affect the investigation.
7	**Investigate – volume experiment** Recognise that sounds get fainter as the distance from the sound source increases.	Working scientifically − Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.	In this small step, children carry out a fair test to explore how the distance from a sound source affects the volume. Children should set up practical equipment and make systematic and careful observations throughout. When undertaking this experiment, it will be difficult to eradicate background noise and therefore this may influence the data they collect. If possible, children could undertake the experiment in a quiet room, such as a hall, to reduce background noise as much as possible. The sound source must be of a consistent volume throughout the investigation, so an alarm or a recorded sound should be used rather than an instrument such as a drum.	Volume, decibel, decibel meter, ear, background noise	Children have not yet looked at decimals in maths. As a result, they should record the volume of sounds using integers to avoid confusion with decimals. Children may need support with measuring distance in metres. This skill may

					need modelling to children before they undertake their investigation.
8	**Evaluate – volume experiment** Recognise that sounds get fainter as the distance from the sound source increases.	Working scientifically − Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.	In this small step, children evaluate their volume experiment. They should work scientifically to analyse data, make conclusions and evaluate their experiment. Within this step, children should be given the opportunity to answer the enquiry question and discuss how the distance from a sound source affects the volume. They should conclude that the greater the distance from the sound source, the quieter the sound will be. Children could compare their data with other groups to allow them to spot patterns and identify any anomalous results. In Year 4, children do not need to use the term “anomalous”, but they should be encouraged to spot any differences in data and discuss why this may have occurred.	Conclusion, volume, decibel, evaluate	Children may think that simply repeating the experiment will increase the reliability of their results. This is not the case. If the investigation is inaccurate, repeating it will just generate more inaccurate results. With support, children need to identify factors that could be controlled next time to ensure their results are more reliable.

Unit Summary	
Term	**Spring (2 Lessons)**
Topic	**Biology: Data Collection B**
The Big Picture	In this unit, pupils build upon their previous observation and data collection from the autumn term, focusing on identifying and naming living things in their local environment, including vertebrates, invertebrates, and different types of plants. Pupils will continue to collect data to understand how seasonal changes influence plant and animal life, deciding on suitable methods to record their findings, such as tables or tally charts. A key aspect of this unit involves pupils presenting their collected data using pictograms and bar charts, and then analysing this information to identify patterns, make comparisons with their Autumn data, and draw conclusions. This process helps pupils develop their ability to make predictions and formulate further questions for investigation.
Key Knowledge	• Pupils learn to identify and name different living things in their local area, including animals with or without spines, and various types of plants.
Enquiry Question	What living things do we have in our local area and does this change over the year?
Enquiry Type	Observation over time
Intended Learning	

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**Data collection B** Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.	Working scientifically – Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.	In this small step, children continue their observation over time enquiry from the Autumn term to name and identify living things in their local area. What living things do we have in our local area and does this change over the year? Children collect data to gain a deeper understanding of how seasonal changes influence plant and animal life. They should use their knowledge of plants and animals from Autumn Block 1 to help them identify familiar species. The data gathered will add to that collected in Data collection A and will also be explored again in the summer term to allow for comparisons to be made across the whole year. Children should decide how to record the data they collect in this step. They may use tables or tally charts, or they may group plants and animals based on similarities.	Vertebrate, invertebrate, flowering plant, non-flowering plant	Children may struggle to identify unfamiliar plants in their local area. Recapping learning from Autumn Block 1 or using free apps that scan and identify plants and animals could be helpful. Children may need to be reminded that invertebrates are animals and should be included in their data collection.
2	**Analyse data** Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.	Working scientifically – Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.	In the previous small step, children continued an enquiry to identify living things in their local area. By completing this enquiry, children gain a deeper understanding of how seasonal changes influence plant and animal life. In this small step, children work scientifically to analyse the data they collected. Children could present their data through pictograms, bar charts, labelled diagrams and data tables. Children compare data and look for patterns and trends. They should identify their key findings from this data collection and then make comparisons to the data collected in Data collection A. Children can see if their predictions from this block were correct. They can then make predictions whether the data will be similar or different in Data collection C and suggest reasons why.	Bar chart, pictogram, data, vertebrate, invertebrate	Children may need support with drawing pictograms, block diagrams or bar charts. They could create physical representations of a block diagram using cubes.

Unit Summary	
Term	**Spring (5 Lessons)**
Topic	**Physics: Electricity**
The Big Picture	In this unit, pupils are introduced to common appliances that use electricity and teaches them how to construct and represent simple series circuits using standard symbols for components like cells, bulbs, buzzers, and switches. Pupils will develop skills in identifying and fixing faults within circuits. Furthermore, the unit explores the concepts of electrical conductors and insulators, enabling pupils to test and classify different materials based on whether they allow electricity to flow through them. Through practical investigations, pupils will build a fundamental understanding of how electrical circuits work and the properties of materials that affect conductivity.
Key Knowledge	• Pupils identify common appliances that use electricity. • They learn to build and draw simple series circuits using standard symbols for components like cells, bulbs, buzzers, and switches. • Pupils develop skills in finding and fixing problems in circuits. • They understand that conductors allow electricity to flow through them, while insulators do not.
Enquiry Question	What materials are conductors or insulators of electricity and is there a pattern?
Enquiry Type	Pattern Seeking

Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**Common appliances that use electricity** Identify common appliances that run on electricity.	Working scientifically – Talk about criteria for grouping, sorting and classifying (non-statutory).	In this small step, children are introduced to the concept of electricity for the first time. They should understand that electricity is a way of moving the energy needed to power appliances. They should identify common appliances that use electricity. Children learn that appliances can either be plugged into the mains at a socket or powered by cells or batteries. In this step, children should think about how they could group different appliances. They also look at some of the dangers of electricity and how it can be extremely harmful. They should identify ways to keep safe when using electrical appliances.	Appliances, plug, socket, cell, electrocuted	Children may not realise most appliances need electricity to be used. Children may find it difficult to understand that appliances that are plugged into the mains and appliances that use batteries both operate using electricity.

					Children may not be aware of the dangers of electricity as it is not visible.
2	**Build and draw series circuits** Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.	Working scientifically − Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.	In the previous small step, children explored electricity and identified appliances that use electricity. In this step, children are introduced to the concept of circuits and will focus on series circuits. These are circuits where all the parts are connected in a single loop. Children build working circuits and explore the role of each part in these circuits. They should be allowed time to explore different circuits and make generalisations. Children will then think about how they could draw their circuits. They should draw circuits they create using pictorial representations and think carefully about how they represent each object. Children do not need to use conventional circuit symbols until Year 6, but they should think about how they can make their representations as accurate as possible. It is important that children build and draw circuits alongside each other to help them understand the link between the concrete and pictorial representations.	Circuit, switch, cell, battery, buzzer	Children may be able to build a series circuit but may not understand how or why it works. Ensure equipment is in working order before children use it as this could lead to misconceptions.
3	**What has gone wrong?** Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery. Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.	Working scientifically − Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.	In this small step, children build upon what they learnt in the previous step. They should still be given time to build and draw circuits, but the focus here is to identify what has gone wrong in a circuit that does not work. Before children use the equipment, ensure that all components that should work do, so children are able to identify problems in circuits correctly. They should look at a range of circuits which do not work for different reasons, including the circuit not being a complete loop or the switch being open. Children should make systematic observations about this and use their knowledge from previous steps to identify ways to fix the circuit. This should also be explored through diagrams. Children should build and then fix the circuits represented in the diagrams to support understanding, if necessary.	Circuit, switch, cell, battery, buzzer	Children may not identify that a circuit will not work if the switch is open. Children may find it easier to identify what has gone wrong when looking at circuits rather than diagrams.
4	**Conductors and insulators** Recognise some common conductors and insulators, and	Working scientifically − Asking relevant questions and using different types of scientific enquiries to answer them.	In this small step, children will be introduced to the terms “conductors” and “insulators”. They should understand that a conductor is a material that allows energy to flow through it and an insulator is a material that does not allow energy to flow through it. Once children are secure with the definitions, they should then begin to look at	Conductor, insulator, metal, material	Children may mix up the meanings of conductors and insulators.

	associate metals with being good conductors.		which materials are conductors and insulators. Children begin a pattern-seeking enquiry question and should make the generalisation that metals are good conductors of electricity. What materials are conductors or insulators of electricity and is there a pattern? This could be extended further by thinking about why materials are used in everyday life, for example why plastic coating is used on electrical wires and why electricians wear gloves made from rubber. This learning will be built upon in the next small step when children explore conductivity within a circuit.		Children may assume that insulators are not used when creating an electrical circuit.
5	**Conductivity within a circuit** Recognise some common conductors and insulators, and associate metals with being good conductors.	Working scientifically – Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.	In this small step, children continue to learn about conductors and insulators, with a greater focus on circuits. They should begin by recapping what conductors and insulators are and the differences between them. Children should think in more detail about how a conductor/ insulator would affect a circuit. It may be useful to remind children of how a switch works and the materials that could be used to create switches within a circuit. Time should be spent testing different materials and then answering the enquiry question for this block. Children should analyse their results and think about generalisations they can make about conductors and insulators.	Conductor, insulator, metal, material	Children may mix up the meanings of conductors and insulators. If children are using the materials to make switches, children may leave the switch open and think the material is an insulator. Children may not notice the properties of conductors and may need prompting to see the similarities/ differences.

Unit Summary	
Term	**Spring (2 Lessons)**
Topic	**Sustainability: Energy**

The Big Picture	In this unit, pupils will explore what energy and energy usage mean, learning how electricity is generated and used in daily life. The unit covers the difference between renewable and non-renewable energy sources, such as wind and solar versus coal and oil. A significant focus is placed on teaching pupils how to reduce their energy consumption at home and school, and understanding the positive impact this has on the planet by burning fewer fossil fuels. Furthermore, pupils will consider the broader environmental implications of products, including their creation, transportation, and disposal, not just their electricity use.
Key Knowledge	• Electricity is energy that runs through wires. • We make electricity by burning oil, coal, and gas, which harms Earth. • Some energy, like wind and sun, never runs out (renewable), unlike coal and oil (non-renewable). • We can use less energy by turning things off and using natural light.
Enquiry Question	How can we reduce our energy usage?
Enquiry Type	Sustainability

Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**What is energy?**	Working scientifically – Asking relevant questions and using different types of scientific enquiries to answer them	This is the first sustainability block in Year 4 and it provides an opportunity for children to consider their energy usage and how it impacts the planet. In this small step, children explore the terms “energy” and “energy usage”. They should learn the different ways in which electricity is generated and the way it is used in their daily lives. Children should think about their daily routines and their use of electricity. They should consider devices that are battery powered and mains-operated, both at home and in school. Children may be aware of energy usage, particularly because of the high cost, but it may be the first time they have thought about the impact it has on the planet. Children explore the question How can we reduce our energy usage?	Electricity, mains electricity, battery powered, renewable energy, non-renewable energy	Children may think that battery-operated devices are better for the planet as they might not recognise that they need to be charged via the mains or that batteries need to be recycled, rather than discarded in the bin. Children might only be aware about the financial cost of using electricity and might have difficulty recognising that

					there is also an impact on Earth's resources.
2	**How can we reduce our energy usage?**	Working scientifically – Using straightforward scientific evidence to answer questions or to support their findings.	In this small step, children explore how they can reduce their energy usage at home and in school. They should then discuss the positive impacts this has on planet Earth. Children should be encouraged to reflect on their routines and highlight the changes that they could make on a daily basis to reduce their energy usage. They also look at other changes they can make on a weekly, monthly or even annual basis. Encourage children to compare the energy usage of things that they use in their lives and think about their impact on the planet, for example they could compare playing on a games console for an hour with playing outside with a ball.	Electricity, mains electricity, appliance, Earth, energy usage	Children may not be aware that an electrical appliance has a larger impact on the planet than just the electricity required to use it. Explain to them that energy and materials are required to make the item and its packaging. The transportation and waste disposal of the packaging and item also have negative impacts on planet Earth.

Unit Summary	
Term	**Summer (3 Lessons)**
Topic	**Biology: Data Collection C**
The Big Picture	In this unit, pupils build upon previous data collection in the Autumn and Spring terms, focusing on naming and identifying living things in the local environment. Pupils will continue to collect data using consistent methods to understand how seasonal changes affect plant and animal life throughout the year. The unit emphasizes analysing this collected data, making comparisons across seasons, and drawing conclusions about how the numbers of certain living things vary due to seasonal conditions. Pupils will also learn to use their understanding of seasons to explain observed differences in their data and to propose new questions for further scientific investigation.
Key Knowledge	• The number of some living things changes throughout the year due to seasonal changes.
Enquiry Question	What living things do we have in our local area and does this change over the year?
Enquiry Type	Observation over time
Intended Learning	

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**Data collection C** Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.	Working scientifically – Gathering, recording, classifying and presenting data in a variety of ways, to help in answering questions.	In this small step, children continue their observation over time enquiry from the autumn and spring terms by naming and identifying living things in their local area. Children collect data to gain a deeper understanding of how seasonal changes affect plant and animal life. Children should use the same data collection method that they used in autumn and spring to allow them to make comparisons. They should add the data they collect in this step to the data they previously collected in Data collection A and B. This will allow for comparisons to be made across the whole year.	Vertebrate, invertebrate, flowering plant, non-flowering plant	Children may struggle to identify unfamiliar plants in their local area. Using free apps that scan and identify plants and animals is helpful. Children may need to be reminded that invertebrates are animals and so should be included in their data collection. Children may need to recap maths skills, such as using tally marks accurately to record their data.
2	**Analyse data** Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.	Working scientifically – Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.	In this small step, children continue their enquiry to identify living things in their local area. They work scientifically to analyse the data they collected in the previous step. They should identify their key findings and begin to make simple generalisations about the data in this block. Children can present their data through pictograms, bar graphs, labelled diagrams and tables. They should use the same method that they used in autumn and spring to allow for comparisons between all three seasons to be made in Step 3 Children should identify their key findings from Data collection C and begin to make simple generalisations from this data. By completing this enquiry, children gain a deeper understanding of how seasonal changes influence plant and animal life.	Bar chart, pictogram, data, vertebrate, invertebrate	Children may need support with drawing pictograms and charts. You may need to model this before they complete their own examples. If children need further support with presenting data, then they could create a physical

					representation of a block diagram using cubes, for example.
3	**Make conclusions** Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.	Working scientifically – Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.	In the previous steps in this block, children have collected and presented data for their enquiry, to identify living things in their local area. In this small step, children analyse the three sets of data collected across the year. This enables them to make conclusions, linking their data and ideas about how seasonal change influences plant and animal life in their local area. Children should make links between their data and how the seasons influence plant and animal life. By the end of this step, children should be able to provide an answer to the enquiry question and raise questions for further investigation.	Seasonal changes, increase, decrease, conclusion, compare	Children may find it challenging to compare data across data sets. Sentence stems will help children to compare one species in different seasons. Some species of plant may be present all year round, but their appearance may change and children may not recognise them.

Unit Summary	
Term	**Summer (4 Lessons)**
Topic	**Biology: Habitats**
The Big Picture	In this unit, pupils are introduced to the concept of habitats as areas where plants and animals live, emphasizing that these environments provide everything living things need to survive. Pupils will investigate local habitats, distinguishing between urban and rural areas, and learn about "biodiversity" as the variety of life in a habitat. The unit also teaches pupils how to use and create classification keys, a tool for sorting and identifying both animals and plants based on their characteristics using "yes" or "no" questions. A significant part of the unit focuses on the impact humans have on habitats, explaining that these effects can be both positive, through actions like creating nature reserves and rewilding to increase biodiversity, and negative, such as habitat destruction from extracting natural resources or deforestation.
Key Knowledge	• A habitat is where animals and plants live and get what they need. • Habitats can be in cities (urban) or the countryside (rural), and both have different living things. • Biodiversity means lots of different plants and animals living in one place.

Enquiry Question	What impacts do humans have on different habitats?
Enquiry Type	Research

Intended Learning					
Lesson	**Learning Objective / National Curriculum link.**	**Skill Objective**	**Brief Overview**	**Key Vocabulary**	**Things to look out for**
1	**Living things and their habitats** Recognise that living things can be grouped in a variety of ways.	Working scientifically – Asking relevant questions and using different types of scientific enquiries to answer them.	In this small step, children investigate the plants and animals within their locality, and how biodiverse these local habitats are. They should explore the differences between urban and rural habitats and how each type meets the needs of the plants and animals that live there. Children should compare this with their local habitat and consider how biodiverse each location is. In Year 2, children explored different types of habitats and how these usually provide everything a plant or animal needs for survival. Children should use the term “biodiversity” to describe the variety of plants and animals living in an environment. In this step, children begin a research enquiry to explore the impact humans have upon different habitats. What impacts do humans have on different habitats? It is important to highlight that humans can have both a positive and negative impact on habitats.	Habitat, rural habitat, urban habitat, biodiversity	Children may not be able to identify what living things need to survive. They should understand that usually a habitat provides everything needed for survival.
2	**Classification keys (animals)** Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.	Working scientifically – Gathering, recording, classifying and presenting data in a variety of ways, to help in answering questions.	In the Autumn term (Block 1), children were introduced to classification keys, and how these can be used to sort and classify both plants and animals based upon their physical characteristics. In the previous step, children explored plants and animals in their local area. In this small step, children continue to explore and create classification keys with increasing independence. When creating their classification keys, children must create closed questions that can be answered using “yes” or “no”. This should be modelled to the children, because they may require support with creating these questions independently.	Classification key, vertebrates, invertebrates, habitat	Children may struggle to use closed questions. They may base their questions upon opinion, or ask questions that are too broad or narrow. Model the construction of closed questions. Children may incorrectly classify animals. Discuss examples of animals that are harder to categorise, before children

					undertake grouping and sorting activities.
3	**Classification keys (plants)** Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.	Working scientifically – Gathering, recording, classifying and presenting data in a variety of ways, to help in answering questions.	In Step 2, children used classification keys to group and classify animals within their local environment. They were tasked with creating closed “yes” or “no” questions, which were then used to group animals based upon their characteristics. In this small step, they continue to develop these skills with increasing independence. They will construct a classification key using the characteristics of plants they might find in the local environment. Children may need support to ask closed questions and with structuring their classification keys. This can be done practically by working in groups to classify plants found in the local environment during Step 1	Classification key, habitat, flowering plant, non-flowering plant	Plants can be harder to classify than animals because children may think that plants all have similar features. Address this by showing images of different plants, for example a tree, a bush and a dandelion, and describing the differences between them.
4	**Human impact on habitats** Recognise that environments can change, and that this can sometimes pose dangers to living things.	Working scientifically – Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.	In this small step, children explore human impacts on plant and animal habitats. Children should be aware that these impacts can be both positive and negative. By the end of this step, children should appreciate that building nature reserves and other projects, such as rewilding, provide a greater variety of habitats for plants and animals to live in. This increases biodiversity. Children should also know that humans can be responsible for the destruction of habitats, for example when extracting natural resources. Children should provide an answer for the enquiry question by the end of this step, describing how humans both damage and protect different habitats	Biodiversity, natural resources, deforestation, rewilding, nature reserve	Children may only be familiar with the negative ways that humans affect the environment. Point out some of the positive ways that humans have affected habitats, and how children can make a difference in their local area.

Unit Summary	
Term	**Summer (2 Lessons)**
Topic	**Sustainability: Deforestation**
The Big Picture	In this unit, pupils are introduced to the concept of deforestation as the clearing of trees from woodlands and forests for human use. Pupils will explore the reasons behind deforestation and its significant impact on habitats, learning how it puts

	plants and animals at risk of becoming endangered or extinct. The unit also highlights human activities, such as the demand for products like palm oil, as key drivers of deforestation, while also introducing the idea of sustainable sourcing. Through this unit, pupils will develop an understanding of how human actions affect the environment both locally and globally.
Key Knowledge	• Deforestation means cutting down lots of trees in forests. • People cut down trees for land or products, like palm oil. • This destroys animal and plant homes, which can make them disappear forever.
Enquiry Question	What are the impacts of deforestation on the planet?
Enquiry Type	Sustainability

Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**What is deforestation?**	Working scientifically – Asking relevant questions and using different types of scientific enquiries to answer them.	In this small step, children build on their understanding of human impacts on habitats and look at the effects of deforestation both locally and globally. Children should define deforestation as the chopping down and removal of trees from a wood or forest. They explore why humans cut down large areas of forest and the impact this has on the plants and animals in these areas. Children explore how deforestation occurs due to a demand for products such as palm oil, which is used in food and cosmetic products. Large areas of forests are cut down to create space for palm plantations. Children explore the question What are the impacts of deforestation on the planet?	Natural resources, deforestation, habitat destruction, biodiversity	Children may not understand the impacts that deforestation has on their local area as they may assume it is only happening in rainforests in the Southern Hemisphere. Children may understand the impact deforestation has on animals but not the impact it has on plants.
2	**What are the impacts of deforestation on habitats?**	Working scientifically Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.	In this small step, children explore how deforestation impacts habitats in their local area and the rest of the world. In the previous block, children investigated different habitats and the plants and animals that live there. Within the previous small step, they also learnt what deforestation is and its impact on biodiversity within an area. In this step, children focus on the damage to orangutan habitats as a result of the production of palm oil, and look at their local area to identify any areas of possible historic deforestation. They could use secondary	Palm oil, deforestation, extinct, endangered, sustainable	Children may not be familiar with palm oil as an ingredient. Look at the ingredients of major food brands to show how common it is.

			sources, such as books and videos, to understand the impact of deforestation further. Children should investigate changes they could make to their lifestyle to help prevent deforestation around the world.		

Unit Summary	
Term	**Summer (7 Lessons)**
Topic	**Biology: The Digestive System**
The Big Picture	In this unit, pupils are introduced to how an animal's diet influences its tooth structure, distinguishing between carnivores, herbivores, and omnivores. Pupils will then learn about human teeth, identifying the four main types—incisors, canines, premolars, and molars—and their specific functions in biting, tearing, grinding, and chewing food. The unit also explores the layers of a tooth, including the protective enamel, and how germs in the mouth can lead to plaque build-up and tooth decay. Furthermore, pupils will delve into the human digestive system, tracing the journey of food from the mouth through the oesophagus, stomach, small intestine, and large intestine, and understanding the role of each organ in breaking down food and absorbing nutrients. Practical activities include tooth decay experiments using eggs and modelling the digestive system.
Key Knowledge	• Animals have different types of teeth (carnivore, herbivore, omnivore) suited to their specific diets. • Humans have four types of teeth—incisors, canines, premolars, and molars—each with a specific function for biting, tearing, and grinding food. • Teeth have layers, including protective enamel, which can be damaged by plaque build-up caused by germs feeding on sugar. • The digestive system breaks down food into smaller pieces for the body to use. • Food travels through the digestive system from the mouth, through the oesophagus, stomach, small intestine, and large intestine.
Enquiry Question	What is the digestive system and how does it work?
Enquiry Type	Research

Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**Teeth – carnivores, herbivores and omnivores** Comparing the teeth of carnivores and	Working scientifically – Identifying differences, similarities or changes related to simple scientific ideas and processes.	In this small step, children build on their knowledge of animal groups, focusing on common carnivores, herbivores and omnivores. Children have been introduced to these terms in Year 1 where they grouped animals based on what they eat. They should now begin to explore how an animal's diet influences the structure of its	Teeth, carnivore, herbivore, omnivore	Children may think that all animals have similar teeth. They should be presented with

	herbivores and suggesting reasons for differences (non-statutory).		teeth. Children do not need to know the names of the different types of teeth as these will be introduced in the next small step. Images, videos and models of different tooth structures would be useful for children to observe during this step. Children should begin to recognise that secondary sources can help to answer questions where they cannot be answered through practical investigations.		images, videos and models of familiar animals, including carnivores, herbivores and omnivores, to demonstrate the differences.
2	**Human teeth** Identify the different types of teeth in humans and their simple functions.	Working scientifically – Asking relevant questions and using different types of scientific enquiries to answer them.	In Step 1, children identified the tooth structure of different animals in relation to their diet. In this small step, they build on their knowledge to understand why humans have more than one type of tooth. They learn the names of the four main types of teeth in the mouth. Children are introduced to the terms incisor, canine, premolar and molar teeth. Children were introduced to teeth in the Humans block in Year 2 and should understand their function to bite and chew food. Throughout this block, children explore what the digestive system is. In this step, children learn that digestion begins in the mouth. Give children opportunities to look at their own teeth with mirrors to look at the different structures.	Teeth, incisors, canines, premolars, molars	Children may have lost teeth and have gaps in their gums where their adult teeth are growing through. Ensure children are aware that most mammals have two sets of teeth in their lifetime. Children may use different words to describe their first teeth. Children may use the terms milk teeth, baby teeth or first teeth.
3	**Layers of the teeth** Identify the different types of teeth in humans and their simple functions.	Working scientifically – Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations (non-statutory).	In this small step, children learn about the layers of the teeth. They use the terms enamel, pulp and root. Children should identify that enamel is the protective layer around the outside of the tooth. The pulp can be described as the sensitive inner part of the tooth and the roots hold the tooth in the jaw. In this step, children look at how bacteria within the mouth feed on sugar and contribute to plaque build-up. Children should be reminded that plaque build-up can cause decay in the tooth if teeth are not brushed regularly. In Year 4, children can still use the term “germs” to describe bacteria in the mouth. In Year 6, children are introduced to the term “microorganisms” and therefore will build on this understanding to name bacteria, viruses and fungi. Children should be reminded that germs are invisible to the human eye.	Teeth, germs, enamel, root, plaque	Children should be reminded that adult teeth are not replaced, and enamel does not regrow.

4	**Plan – tooth decay experiment** Identify the different types of teeth in humans and their simple functions.	Working scientifically – Setting up simple practical enquiries, comparative and fair tests.	In the previous step, children looked at the layers of the teeth and identified the enamel, pulp and roots. In this small step, children plan and set up an investigation into the effects different liquids have on the egg. The eggs can be used to model a tooth, as the shell is made from similar materials to tooth enamel. The eggs should be added to different liquids and left-over time. Children should understand that the shells of the eggs may become weakened by the different liquids. They should understand that germs (bacteria) in the mouth feed on sugars and produce acid which can break down the enamel on the teeth. Therefore, they should notice that liquids with a higher sugar content have a greater effect on the egg as more acid is produced which breaks the shell down similar to the enamel on teeth. Later in the block, there is a step which looks at the findings from this experiment.	Teeth, germs, enamel, root, plaque	Children should understand that they will not see the effects on the eggshell straightaway, but they should observe a change over time. Children may point out that the egg is not the same as a tooth. Explain that the material of eggshells is similar to that of human teeth.
5	**The digestive system** Describe the simple functions of the basic parts of the digestive system in humans.	Working scientifically – Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.	In this small step, children explore the digestive system and the route food takes through the body, starting with the teeth. This step introduces children to the oesophagus, stomach, small intestine, large intestine and rectum. In this step, children should use the scientific words for organs in the digestive system such as “intestine” and “oesophagus”. Give them opportunities to hear and use these words repeatedly. By the end of this step, children should be able to define digestion and describe the route taken by food from when it is bitten to when it reaches the rectum. Children are introduced to the enquiry question for this block and are carrying out a research enquiry. What is the digestive system and how does it work?	Digestive system, mouth, intestines, saliva, stomach, rectum, oesophagus	Children may be familiar with other words for the scientific language introduced in the step, for example “spit” for saliva and “tummy” for stomach. It may be useful to use familiar words at first to introduce the new vocabulary.
6	**The digestive system – model** Describe the simple functions of the basic parts of the digestive system in humans.	Working scientifically – Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.	In this small step children understand the process of digestion through modelling. In the previous step, children were introduced to the key terms saliva, oesophagus, stomach, small intestine, large intestine and rectum. They should be able to list these organs in the order that food travels through them and identify the function of each. In this step, children create a model of the digestive system to support their understanding of digestion. It could be useful to model this as a teacher demonstration initially to describe the process of digestion before children create their own digestion model. By the end of this step,	Digestive system, mouth, intestines, saliva, stomach, rectum, oesophagus	When demonstrating the digestion model, it is difficult to separate the small and large intestine. Ensure children are aware that these are two different

			children should be able to give written and oral explanations about the process of digestion and the stages food goes through as it passes through the body.		organs in the digestive system.
7	**Findings – tooth decay experiment** Identify the different types of teeth in humans and their simple functions.	Working scientifically – Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.	This small step focuses on the findings of the tooth decay investigation that children planned and set up in Step 4. Children should understand that the shells of the eggs may become weakened by the different liquids. They should understand that germs (bacteria) in the mouth feed on sugars and produce acid which can break down the enamel on the teeth. Therefore, they should notice that liquids with a higher sugar content have a greater effect on the egg as more acid is produced which breaks the shell down similar to the enamel on teeth. By the end of this step, children should be able to describe the findings of their experiment, for example that the egg in cola changed colour, whereas the egg in water was unchanged.	Teeth, germs, enamel, decay, plaque	As the investigation involves observations over time, it is important to revisit the content from Step 4. Children may think that this change happens quickly. It is important to tell children that this happens over a long time naturally, but that we still need to look after our teeth daily.

Unit Summary	
Term	**Summer (4 Lessons)**
Topic	**Biology: Food Chains**
The Big Picture	In this unit, pupils are introduced to the food chains as an order of living things showing how energy is transferred when one eats another. Pupils will learn to identify producers (living things like plants that make their own food from the Sun), consumers (living things that eat others), predators (animals that eat prey), and prey (animals eaten by predators). They will practice interpreting and drawing food chains, understanding that arrows show the direction of energy transfer. The unit also explores how human activities, such as habitat destruction, hunting, farming, and overfishing, can impact food chains and potentially lead to the extinction of some living things.
Key Knowledge	• Food chains show how energy moves as living things eat each other. • Plants are producers and start food chains because they make their own food using the sun. • Animals are consumers, meaning they eat other living things for energy. • Some animals hunt and eat other animals (predators and prey).
Enquiry Question	How has human activity affected food chains?

Enquiry Type	Research				
Intended Learning					
Lesson	**Learning Objective / National Curriculum link.**	**Skill Objective**	**Brief Overview**	**Key Vocabulary**	**Things to look out for**
1	**What is a food chain?** Construct and interpret a variety of food chains, identifying producers, predators and prey.	Working scientifically – Using straightforward scientific evidence to answer questions or to support their findings.	In Year 2, children were introduced to the concept of a food chain. They learnt that a food chain is an order of living things, to show how energy is transferred when one living thing eats another. In this small step, children explore food chains and should identify the producer, consumers, prey and predators in a range of different food chains. By the end of this step, children should identify plants as producers as they get their energy from the Sun. They should also identify animals as consumers as they get their energy by "consuming" or eating other things.	Food chain, producer, predator, prey, consumer	Children may not recognise the importance of the direction of the arrows in the food chains. Allow children to construct or complete simple food chains to practise drawing the arrow in the direction of the energy transfer. It is important for children to recognise that an animal can be described using more than one scientific word, for example it may be both a predator and a consumer.
2	**Interpret food chains** Construct and interpret a variety of food chains, identifying producers, predators and prey.	Working scientifically – Using straightforward scientific evidence to answer questions or to support their findings.	In this small step, children apply their knowledge to interpret what individual food chains show. Children learn that habitats have food chains of different lengths and that there can be more than one type of prey or predator in a single chain. It is important to use examples of familiar food chains to introduce the fact that a consumer can be a predator, prey or both. By the end of this step, children should be able to use scientific words to explain specific food chain examples. In particular, children should state that the producer creates its own energy using sunlight, which is transferred along the food chain through each consumer.	Food chain, producer, predator, prey, consumer	Children may find food chains that are drawn across the page unintuitive because of the phrase "top of the food chain". The direction of the arrows is what indicates the direction of

					energy transfer. It can be helpful to use the term “end of the food chain” instead to avoid this misconception.
3	**Draw food chains** Construct and interpret a variety of food chains, identifying producers, predators and prey.	Working scientifically − Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.	In this small step, children build on their knowledge from previous steps to create and draw food chains. They should place producers, consumers, prey and predators in the correct order, with arrows showing the transfer of energy from the producer through to the predator. It is important to provide children with familiar animals and plants from a range of habitats such as forests, woodlands and oceans. Model the creation of different food chains before giving time for individual practice. Children should apply their scientific knowledge in this step while using a range of relevant vocabulary.	Food chain, producer, predator, prey, consumer	Children may be unfamiliar with food chains involving less well-known predatory animals such as birds of prey. Ensure examples of familiar living things are used where possible. Children may find food chains that are drawn across the page unintuitive because of the phrase “top of the food chain”. The direction of the arrows is what indicates the direction of energy transfer.
4	**What would happen if?** Construct and interpret a variety of food chains, identifying producers, predators and prey.	Working scientifically − Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.	In this final small step, children explore the potential impact of human activity on food chains. Specifically, they explore the impacts of habitat destruction, hunting, farming and overfishing on the population of different living things. Children may be familiar with these activities on smaller scales. It is important to emphasise that some human activity may be necessary to provide communities with food, but excessive farming, hunting or fishing can lead to species becoming endangered. Provide children with food chains of familiar animals and allow them to discuss how a decrease in one species could affect	Food chain, habitat, farming, over fishing, hunting	Children may not think of plants as living things and may believe that human activity only affects the population of animals in food chains. Children may find it more

			another species in the chain. Children explore the question ‘How has human activity affected food chains?’		challenging to see how producers are affected by an increase or decrease in prey and predators. Give examples of a predator decrease which results in a prey increase and explain that this causes producers to decrease in number as there are more consumers to feed off them.

Year 5

Autumn	Spring	Summer
Physics: Forces Physics: Space Sustainability: Global Warning	Chemistry: Properties of materials Biology: Animals including humans Biology: Life cycles	Biology: reproduction A Chemistry: Reversible and irreversible changes Sustainability: Plastic pollution Biology: Reproduction B

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn term	Physics **Forces** VIEW					Physics **Space** VIEW					Sustainability **Global warming** VIEW	Consolidation
Spring term	Chemistry **Properties of materials** FREE TRIAL VIEW					Biology **Animals including humans** VIEW				Biology **Life cycles** VIEW		
Summer term	Biology **Reproduction A** VIEW					Chemistry **Reversible and irreversible changes** VIEW		Sustainability **Plastic pollution** VIEW	Biology **Reproduction B** VIEW		Consolidation	

Topic Context

Pupils start the Autumn Term by looking at 'Forces'. In this block, pupils are introduced to the concept of gravity. They then build on this knowledge and explore gravity further in the subsequent 'Space' block.

The 'Materials' block has been split over two terms. Pupils begin by examining the properties of materials in the Spring Term, testing and grouping them based on characteristics such as transparency, thermal and electrical conductivity, and their response to magnets.

Pupils then study the 'Life cycle of humans' from birth to old age, before applying their understanding of life cycles to other animals in Block 3.

In the Summer Term, pupils investigate the processes of sexual and asexual reproduction in 'Reproduction A and B'. This block is taught later in the year due to its complexity and is split to allow pupils to explore whether they can grow a new plant using different parts of a parent plant.

Finally, pupils examine 'Reversible and Irreversible changes'. This block is placed in the Summer Term also due to its complexity, ensuring pupils have developed their scientific inquiry skills throughout the year before tackling this topic.

Enquiry Types Mapped

Unit Summary	
Term	**Autumn (9 Lessons)**
Topic	**Physics: Forces**
The Big Picture	In this unit, pupils are introduced to the concept of forces as pushes or pulls that can cause objects to start or stop moving, change direction, or change speed. Pupils will investigate various types of forces, including gravity, air resistance, water resistance, and friction. They will learn how mechanisms like levers, pulleys, and gears allow smaller forces to have a greater effect. A key aspect of the unit is for pupils to understand that unsupported objects fall towards Earth due to the force of gravity. They will also explore how forces are measured using newtons and how to use a force meter. Practical activities and investigations will allow pupils to observe and test the effects of these different forces.
Key Knowledge	• Forces are pushes or pulls that can make objects start or stop moving, change direction, or change speed. • Gravity is a force that pulls unsupported objects towards Earth. • Different forces include air resistance, water resistance, and friction. • Forces are measured in newtons using a force meter. • Mechanisms like levers, pulleys, and gears can make a smaller force have a bigger effect.
Enquiry Question	Does the size of a parachute affect the time it takes for it to fall to the ground?
Enquiry Type	Fair test

Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**Friction** Identify the effects of air resistance, water resistance and friction, that act between moving surfaces.	Working scientifically – Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas (non-statutory).	In Year 3, children were introduced to the concept of forces, and they explored friction. Children should know that friction is a contact force between two surfaces. In this small step, children recap what friction is and look at the effects of friction. They should understand that friction always works in the opposite direction to that in which the object is moving. Children also explore how friction is useful in everyday life, such as in helping car tyres to grip the road and enabling brakes to slow down a bicycle wheel.	Force, contact force, frictional force, motion	Children may think friction only occurs when two surfaces are moving. Clarify that friction occurs even when the two surfaces are not moving. Children may think that friction only occurs between rough surfaces. It also occurs between

					smooth surfaces, such as glass.
2	**Air resistance** Identify the effects of air resistance, water resistance and friction, that act between moving surfaces.	Working scientifically – Recognise which secondary sources will be most useful to research their ideas (non-statutory).	In this small step, children build on their knowledge of friction to look at air resistance. Children learn that air resistance is a type of friction force on an object moving through air. The effects and benefits of air resistance in everyday life are also covered. Children learn how the amount of air resistance is affected by the size and shape of an object and how people use this knowledge when designing objects. It is important that children are shown a wide range of examples of air resistance, such as against trains and aeroplanes, to ensure they do not form a misconception that air resistance only occurs when something is falling in a downward motion.	Air resistance, frictional force, parachute, force	Children may think that because forces are invisible, they do not cause changes in objects. Air resistance is a force that can also change an object's speed, shape and direction. Children may believe that no air resistance is acting on an object if the object is travelling at a constant speed in a straight line.
3	**Plan – parachute experiment** Identify the effects of air resistance, water resistance and friction, that act between moving surfaces.	Working scientifically − Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.	Over the next three steps, children carry out a fair test to find out whether the surface area of a parachute affects the time it takes to fall to the ground. In this small step, children plan their parachute experiment, make predictions and identify variables. It is essential that they identify the experiment equipment and explain why it is used. When planning, children are introduced to the term variables for the first time. This includes the independent, dependent and controlled variables. Children should describe the independent variable as the variable they change. The dependent variable is the variable they measure and the controlled variables are the variables they keep the same. Children explore the enquiry question 'Does the size of a parachute affect the time it takes for it to fall to the ground?'	Independent variable, dependent variable, controlled variable	Children may confuse the variables when planning the investigation. Children may need extra support when identifying the equipment that is most suitable to use in their experiment. Children may need to recap how to use a stopwatch to record time accurately.

4	**Investigate – parachute experiment** Identify the effects of air resistance, water resistance and friction, that act between moving surfaces.	Working scientifically − using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.	In this small step, children carry out the parachute experiment. To get valid results, at least three different sizes for the parachutes should be used. When timing the parachute drops, children should record time in parts of seconds, as using whole seconds will not give accurate enough results to make a comparison. Children should drop the parachute from the highest point they can without compromising safety. This makes it easier for them to record the time it takes for the parachute to fall to the ground.	Air resistance, parachute, repeatability, precision	Children might think that it is wind acting on the parachute that slows it down rather than air resistance. Children may not know how to use the stopwatch correctly in terms of start, stop and resetting to zero. Ensure that children practise this before starting the experiment. Make sure children spread out the parachute fully before dropping it. Make sure the modelling clay that children attach to the parachute is not too large. If it is too heavy, it will drop too fast for the children to time.
5	**Evaluate – parachute experiment** Identify the effects of air resistance, water resistance and friction, that act between moving surfaces.	Working scientifically − Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results.	In this small step, children look at the results of the parachute experiment in Step 4. Children evaluate and suggest improvements for their experiment. Children should determine that the greater the surface area of the parachute, the more air resistance acts on the parachute and hence the longer it takes to reach the ground. It is important to remember that extending an experiment does not mean repeating it. The parameters of the experiment need to change, such as dropping the parachute from	Surface area, repeatability, precision, anomalous results	Children should be made aware that if the investigation does not properly test what it is meant to, then repeating it again will not

			different heights or using different materials for the parachutes.		improve the results. Children may not have a clear understanding of the terms “anomalous results” and “repeatability”. Ensure they are confident with these terms by reinforcing the definitions stated in the key vocabulary.
6	**Plan – water resistance** Identify the effects of air resistance, water resistance and friction, that act between moving surfaces.	Working scientifically − Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.	In this step, children are introduced to water resistance. They plan a comparative test to observe whether the shape of an object affects the time it takes for it to fall to the bottom of a measuring cylinder filled with water. Children should understand that the more streamlined an object is, the less water resistance will act upon it. This means that more streamlined objects will move through water more easily and with less effort. Children can link this to real-life examples such as sharks and dolphins. When children complete the experiment plan, ensure they are using the terms “independent” and “dependent” variables correctly. They should also be able to identify variables that they will control during the experiment. Discuss ways children can improve their experiment plan, such as controlling variables and repeating their results to reduce the effects of anomalous results.	Independent variable, controlled variable, dependent variable	Children may think that water resistance only occurs in water and not in other liquids.
7	**Investigate – water resistance** Identify the effects of air resistance, water resistance and friction, that act between moving surfaces.	Working scientifically − Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.	In this small step, children carry out a comparative test to explore whether the shape of an object affects the time it takes to fall to the bottom of a measuring cylinder. They should understand that more streamlined objects have less water resistance and should fall to the bottom of the measuring cylinder more quickly. Children should discuss their findings and make conclusions using the data collected from the experiment. They will also discuss ways of extending their experiment. It is important to remember that extending an experiment does not mean repeating it. The parameters of the experiment need to	Water resistant, streamlined, repeatability, precision	Children may think that water resistance must always have water to create a force against an object, but water resistance can occur in any liquid.

			change, such as using different shapes, or dropping the objects into a different liquid.		Children may think that water resistance is not a type of friction. Clarify that water resistance is a type of friction because the water reduces the speed of the object.
8	**Explore gravity** Explain that unsupported objects fall towards the Earth because of gravity acting between the Earth and the falling object.	Working scientifically − Identifying scientific evidence that has been used to support or refute ideas or arguments.	In this small step, children explore gravity. It is difficult for children to understand gravity because it cannot be seen. All objects have a gravitational pull. The greater the mass of the object, the greater the gravitational pull. The force of gravity always acts towards the centre of the Earth because Earth has the greatest mass compared to the objects on it. Weight is measure in Newtons (N) and the amount of gravity acting upon an object. Children will not have used a Newton meter before and will need to be shown how to use this piece of equipment. Air resistance and an object's surface area are the main things that affect the rate at which an object falls. Mass and weight do not affect the rate of fall. Objects with different masses, but the same surface area, fall at the same rate because the gravitational pull on them is the same.	Gravitational force, weight, contact force, non-contact force	Children may think that heavier objects will fall to the ground more quickly than lighter objects. Children may think that there is no gravity on the Moon. The Moon has less gravitational pull than the Earth as it has less mass.
9	**Use small forces for greater effects** Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.	Working scientifically − Recognise which secondary sources will be most useful to research their ideas (non-statutory).	In this small step, children look at different mechanisms including levers, pulleys and gears. They learn that these mechanisms are designed to make some jobs easier, by changing a smaller force into a larger force. Children also look at everyday uses of levers, pulleys and gears including those used in bicycle gears and opening tins of paint. By the end of this step, children should know that smaller gears with fewer teeth will cause a faster rotation. Children could look for examples of levers, gears and pulleys in their classroom, school or wider local area. Whenever possible, children should link their knowledge of gears, levers and pulleys to everyday examples to allow them to understand why they are used.	Lever, gear, pully, machine	Children may believe that the larger the gear and the more teeth it has, the faster the movement will be. Use as many everyday examples of gears, levers and pulleys to help children understand how these mechanisms work. Examples include gears on a

					bike, a seesaw and exercise equipment.

Unit Summary	
Term	**Autumn (8 Lessons)**
Topic	**Physics: Space**
The Big Picture	In this unit, pupils are introduced to the Solar System, explaining that it comprises the Sun, eight planets, their moons, and other celestial bodies. Pupils will learn about the characteristics of these planets, including their surfaces, and how they orbit the Sun due to its gravitational pull. The unit also covers how models are used in science to represent complex concepts like the Solar System. Furthermore, pupils will explore the motion of Earth and other planets, the cause of day and night due to Earth's rotation, and the reasons for seasons. A significant focus is placed on how ideas about the Solar System have evolved over time, introducing pupils to historical scientific figures like Aristotle, Ptolemy, Copernicus, Galileo, and Newton. Finally, pupils will investigate Earth's Moon, understanding its orbit around Earth and that it reflects light from the Sun.
Key Knowledge	• Our Solar System includes the Sun, eight planets, their moons, and other space objects. • The Sun is the star at the centre of our Solar System, and its strong pull keeps all the planets orbiting it. • Earth spins on its imaginary line (axis) once every 24 hours, which gives us day and night. • The Moon orbits Earth in about 27 days and gets its light from the Sun.
Enquiry Question	How have ideas about the Solar System changed over time?
Enquiry Type	Research

Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**The Solar System** Describe the Sun, Earth and Moon as approximately spherical bodies.	Working scientifically – Identifying scientific evidence that has been used to support or refute ideas or arguments.	In this small step, children learn about the Solar System. The Solar System is made up of the Sun, eight planets and their moons and millions of other smaller celestial bodies. It is important to note that children have not studied space and the Solar System before. As a result, they may have a limited understanding of the key terms and what makes up the Solar System. This step introduces the enquiry question for this block. How have ideas about the Solar System changed over time? Children complete a research enquiry to understand how our ideas about the Solar System have changed over	Solar system, planets, orbit, sun	Children may think that there is more than one star in the Solar System. Clarify that the only star in the Solar System is the Sun.

			time. Children look at the views of different scientists and mathematicians. They compare these views to current ideas about the Solar System.		Children may think that Pluto is a planet. Explain that Pluto was reclassified as a dwarf planet because it is not big enough to be regarded as a planet.
2	**The planets** Describe the Sun, Earth and Moon as approximately spherical bodies.	Working scientifically – Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.	In this small step, children learn about the eight planets in the Solar System and their features. Children learn that all the planets in the Solar System orbit the Sun. They look at the different surfaces of the planets. They learn that the first four planets from the Sun have a solid surface. The other four planets are made mostly of gas and do not have a solid surface. Children investigate the enquiry question in this step. They look at how the planets orbit the Sun and, in later steps, compare this to previous ideas about the movement of planets. They should be given opportunities to develop their thinking and reasoning.	Planet, orbit, Pluto, celestial body	Children may believe that Earth is larger than the Sun. Children may think that all planets have a hard rocky surface like Earth. Children may believe that Earth is the only planet with a moon. Earth has one moon but several other planets have more than one moon. For example, Uranus has 28 known moons.
3	**Modelling** Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.	Working scientifically – Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.	In this small step, children learn how to use models to represent the Solar System and planets. It is important that children recognise that models have advantages and disadvantages, but can be used to visualise concepts that are difficult to understand. Children continue to explore the enquiry question in this step to further their understanding of the Solar System. They do this by using knowledge from the previous step to create their own models of the Solar System. They should then be able to describe their model and explain why they have created it as they have.	Sun, planet, model, orbit	Children may believe that all planets are the same size. Children may think that all planets are the same distance from the Sun. Children may believe that the

					Sun is the same size as the planets.
4	**Motion of the Earth and planets** Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.	Working scientifically – Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.	In this small step, children learn about the movement of Earth and the other planets in the Solar System. This includes how long it takes each planet to orbit the Sun and why. Children continue to explore the enquiry question in this step. They should be given opportunities to develop their thinking regarding motion of the planets and the heliocentric model. Children should explain the movement of the planets around the Sun with reference to key vocabulary such as gravity, gravitational pull and the heliocentric model. They should understand that, in the Solar System, the Sun has the greatest gravitational pull. This is why all planets orbit the Sun.	Gravity, orbit, heliocentric, geocentric	Children may believe that it takes every planet about 365 days to orbit the Sun. Explain that each planet takes a different number of days or years to orbit the Sun. For example, it takes Earth about 365 days, but Jupiter takes the equivalent of 12 Earth years to orbit the Sun. Explain to children that each planet has a different length day and year.
5	**The Solar System – ideas over time** Describe the movement of the Earth, and other planets relative to the Sun in the solar system.	Working scientifically – Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations.	In this small step, children explore how ideas about the Solar System have changed over time. They learn how different scientists and mathematicians have contributed to our understanding of the Solar System, including the positioning of the Sun and planets. In this step, children research the work of Aristotle, Ptolemy, Copernicus, Galileo and Newton. Children should be given the opportunity to present their findings through presentations, discussions and written responses.	Geocentric model, heliocentric model, model, planet	Children may believe that the planets cannot be seen without a telescope. Children may believe that Earth is flat. Explain that people once thought this, but now we know that Earth is spherical. Children may think that Earth is at the centre of the Solar System. Explain that the Sun is at the

					centre of the Solar System with the eight planets orbiting it.
6	**Planet Earth** Use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky.	Working scientifically − Identifying scientific evidence that has been used to support or refute ideas or arguments.	In this small step, children look at planet Earth. Children learn that Earth completes a full rotation around its axis once every 24 hours. This is why we have a 24-hour day. Clarify to children that the Sun does not move. It is Earth that moves and rotates. Demonstrate to children how Earth rotates around its axis to challenge any misconceptions that they may have. Within this step, there is an opportunity for children to identify how planet Earth is changing. Children can find out what global warming is and the effects it is having on our planet. They do not need to discuss the concept in detail in this step because they will explore the impacts of global warming further in the next block.	Rotate, North pole, South pole, axis, Earth	Children may believe that the Sun rotates around the Earth. Children may think that Earth is the largest object in the Solar System, not the Sun. Children may think that other planets can support life. Explain that currently Earth is the only planet in the Solar System that is known to be able to support life.
7	**Night and day** Use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky.	Working scientifically − Identifying scientific evidence that has been used to support or refute ideas or arguments.	In this small step, children explore the concept of night and day and how they occur because of the rotation of Earth around its axis. As in the previous step, it is important to demonstrate to children how night and day occur, to help address any misconceptions that they may have. By the end of this step, children should understand that it takes Earth 24 hours to rotate around its axis. When Earth rotates, it is day on the side that faces the Sun and night on the side that faces away from the Sun.	Axis, rotate, Earth, sun, night, day	Children may think that the Sun disappears at night. Children may believe that night and day are caused by the Sun moving around Earth. Clarify to children that Earth rotates around its axis and each rotation takes 24 hours.

					Children may think that the Sun appears in the morning then moves across the sky and disappears in the evening. Clarify to them that the Sun does not move, it is Earth that rotates.
8	**The Moon** Describe the movement of the Moon relative to the Earth.	Working scientifically − Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations.	In the final small step in this block, children explore the Moon and its features. This includes what the Moon looks like, its surface and how long it takes to orbit Earth. They learn that other planets have their own moons and some have multiple moons. It is important that children understand that the Moon orbits Earth and stays in orbit due to the Earth's gravitational pull. By the end of this step, children should demonstrate their understanding through both written and verbal responses.	Moon, gravitational force, orbit, satellite	Children may believe that the Moon can be seen only during the night. Children may think that the Moon emits its own light. Explain that the Moon reflects light from the Sun. Children may believe that Earth's Moon is the only moon in the Solar System. Explain that other planets have their own moons because they have a gravitational pull, just like Earth.

Unit Summary	
Term	**Autumn (2 Lessons)**
Topic	**Sustainability: Global Warming**
The Big Picture	In this unit, pupils will develop a basic understanding of global warming, including what it is and why it's happening, with a focus on how human actions, such as the burning of fossil fuels, contribute to the greenhouse effect and climate change. The unit also clarifies that global warming is the gradual increase in the Earth's temperature, which can lead to climate change and different weather patterns. Pupils will explore the effects of global warming on humans, animals, and plants, understanding that it can cause glaciers and ice caps to melt, leading to rising sea levels and flooding, and can also result in droughts, making it difficult to grow crops. A key aspect of the unit is to empower pupils by showing them how their own actions and choices can help reduce their carbon footprint and lessen the damaging impact on the planet, encouraging them to research and implement ways to reduce global warming in their local community and school.
Key Knowledge	• Global warming is when Earth's temperature slowly goes up. • Gases that trap the Sun's heat, called greenhouse gases, cause Earth to warm up (the greenhouse effect). • People cause global warming by burning fossil fuels like coal, oil, and natural gas, which release greenhouse gases. • When global warming happens, ice caps and glaciers melt, leading to higher sea levels and floods. • Global warming impacts everyone and everything—people, animals, and plants—by changing weather patterns and causing things like droughts and floods.
Enquiry Question	What is global warming and how can we help to reduce it?
Enquiry Type	Sustainability

Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**What is global warming?**	Working scientifically – Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact (non-statutory).	In this small step, children build on their understanding of planet Earth and look at the current issues around climate change and global warming. Children gain a simple understanding of global warming and learn what it is and why it is happening. They have opportunities to explore how global warming occurs, with reference to human action. This includes the burning of fossil fuels, which leads to the greenhouse effect and climate change. Children explored gases and their properties in Year 4, when they learnt about states of matter. They are now introduced to the term “greenhouse gases”, which are gases that are contributing to global warming. Children do not need to identify and name each greenhouse gas and	Global warming, greenhouse gases, fossil fuels, climate change	Children may think that global warming and climate change are the same thing. Clarify to them that “global warming” refers to the gradual increase in the Earth’s temperature. This can lead to

			its effects on the planet, but should be able to use the term “greenhouse gases”. Children explore the question ‘What is global warming and how can we help to reduce it?’		climate change and different weather patterns.
2	**What are the impacts of global warming on living things?**	Working scientifically – Identifying scientific evidence that has been used to support or refute ideas or arguments.	In this small step, children explore the impacts of global warming on living things. This step gives children the opportunity to work scientifically and practically and to think of ways to reduce their own (or their school’s) carbon footprint. Some children may have some anxiety about the impacts of climate change. They should understand by the end of this step that they can reduce their damaging impact on the future of planet Earth through their own actions and choices. Children could research the different ways that humans can reduce global warming and climate change. They find out what they can do in their local community and school to help promote activities that can reduce global warming. Children should make small changes within their school setting to reduce their carbon footprint. They should understand why reducing their carbon footprint has positive effects for living things.	Global warming, glacier, habitat, climate change, carbon footprint	Children may think that only humans are affected by global warming. Discuss with them how other animals and plants are also affected.

Unit Summary	
Term	**Spring (6 Lessons)**
Topic	**Chemistry: Properties of Materials**
The Big Picture	In this unit, pupils are introduced to testing and grouping everyday materials based on their physical properties, including magnetism, transparency (transparent, translucent, opaque), and hardness. Pupils will learn that a harder material can scratch a softer one and that most metals are non-magnetic, with only a few, like iron and steel, being magnetic. The unit also covers electrical conductivity, teaching pupils to build simple circuits to test which materials allow electricity to flow (conductors) and which do not (insulators). Additionally, pupils will engage in planning, investigating, and evaluating experiments on how well different materials insulate heat. Finally, pupils will explore the appropriate uses of common materials like plastic, wood, and metal, linking their specific properties to practical applications.
Key Knowledge	
Enquiry Question	Which material is the best insulator of heat?
Enquiry Type	Comparative test
Intended Learning	

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**Test materials – magnetism, transparency and hardness** 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.	Working scientifically − Use and develop keys and other information records to identify, classify and describe living things and materials (non-statutory).	In this small step, children test everyday materials and group them based on their transparency, hardness and magnetism. They also link the properties of materials to their uses. Within younger year groups, children have looked at these concepts but they will need to be revisited within this step. There are a variety of methods to test the hardness of materials. Testing for hardness can be comparative. Children should understand that a harder material will scratch a softer material. Children should be encouraged to group the materials they have tested in different ways based on a range of categories. It is important that children are encouraged to group the materials into more than just two groups, to challenge their understanding of the properties of materials.	Transparent, translucent, opaque, magnetism, hardness	Children may think that all metals are magnetic. Children may be familiar with the terms “transparent” and “opaque”. However, they may find the term “translucent” difficult to understand. Children may think that all solids and metals are hard.
2	**Test materials – electrical conductivity** 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.	Working scientifically − Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.	In this small step, children test some everyday materials and group them based on their electrical conductivity. This step builds on the electricity block studied in Year 4. The materials will be classified as conductors or insulators. By the end of this step, children identify that conductors allow electricity to pass through them easily and can complete an electrical circuit. They should also be aware that non-conductors (insulators) do not let electricity pass through them. Children should build circuits to test whether different materials can conduct electricity. They may need to recap how to build a working circuit before completing this step. Children should only use a battery, bulb and wires in their circuit. They should draw the circuit pictorially. Conventional circuit symbols will be introduced in Year 6	Electrical conductor, electrical insulator, circuit, cell, bulb	Children may think that only metals are conductors of electricity. Children have built circuits in Year 4. However, they may need some guidance on how to build a working series circuit before testing materials.
3	**Plan – insulating heat experiment** Compare and group together everyday materials on the basis of their properties,	Working scientifically − Planning different types of scientific enquiries to answer questions, including recognising and	In this small step, children plan a comparative test to investigate which material is the best thermal insulator. Over the next three steps, children explore which material is the best at keeping hot water warm through the enquiry question ‘Which material is the best insulator of heat?’ Children learn that a thermal insulator is a material that prevents heat passing through it. They should choose	Independent variable, controlled variable, dependent variable	Children may think that insulators are only used to keep things warm. They can also keep things cold. Ice

	including their hardness, solubility, transparency, conductivity (electrical and thermal) and response to magnets.	controlling variables where necessary.	three different materials, such as bubble wrap, aluminium foil and felt, to wrap around the beakers filled with hot water. Alongside this, children should have a beaker that is not wrapped in any material. This beaker provides a control that they can use to measure temperature differences against. Children have learnt how to use a thermometer in Year 4 (States of matter block) to accurately measure the temperature of water over time. However, this skill may need practising prior to the investigation. Within this step, children should create their experiment plan and identify the independent, dependent and controlled variables.		melts when the heat in a room is transferred to the ice. An insulator slows down this transfer of heat.
4	**Investigate – insulating heat experiment** Compare and group together everyday materials based on their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal) and response to magnets.	Working scientifically − Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.	In this small step, children carry out a comparative test to explore which materials are the best insulators of heat. Before they begin the investigation, children should be encouraged to recap their experiment plan and identify the independent, dependent and controlled variables. Within the spring term, children should set up their own investigations more independently, including the control beaker. They should identify that the control beaker is one without any layers of material insulation. They should be able to identify that having a control beaker allows them to compare the temperature change of water in an uninsulated beaker with the temperature changes of water in beakers with different types of insulating layers.	Thermal insulator, thermometer, controlled beaker, temperature	When setting up the experiment, the temperature of the water should not exceed 50°C to align with health and safety regulations. Children may think that their results are inaccurate once all four beakers have reached room temperature and the temperature in each beaker is the same.
5	**Evaluate – insulating heat experiment** Compare and group together everyday materials based on their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal) and response to magnets.	Working scientifically − Using test results to make predictions to set up further comparative and fair tests.	In this small step, children work scientifically to analyse data, make conclusions and evaluate the insulation experiment from Step 4. Children can use the evaluation sentence stems to structure their written analysis and evaluation. Within this step, children should use their data to explain which material was the best insulator of heat. Children should be encouraged to refer to the control beaker within their evaluation. This will allow them to make a comparison between the insulated beakers and the non-insulated beaker. Children should be given the opportunity to answer the enquiry question and discuss which material is the best insulator of heat. They should	Thermal insulator, temperature, data, conclusion, anomalous results	Children may think that the experiment is inaccurate as heat has been lost due to the beakers having open tops. Use this as a point within the evaluation step to discuss how to make the experiment more

			determine that the best insulating materials will slow down the warm air passing through the insulation.		reliable if they were to undertake it again.
6	**Uses of everyday materials – plastic, wood and metal** Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.	Working scientifically – Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas (non-statutory).	In this small step, children look at three common materials, plastic, wood and metal, and link the uses of these materials to their properties. In this block, children have completed a variety of tests to explore electrical and thermal conductivity as well as hardness, transparency and magnetism. When thinking about the uses and suitability of materials for different purposes, children should be encouraged to use evidence from their own testing to explain why a material would be suitable or unsuitable for use. Children should identify that some materials have the same uses and all the different properties must be considered to make a justified decision on which material is best for the particular use. Sometimes, two or more of the materials can be correct.	Properties, wood, metal, lifespan, plastic	Children may think that an object can only be made from one material. Show examples of objects that are made from a mixture of multiple materials and discuss their suitability for purpose.

Unit Summary	
Term	**Spring (6 Lessons)**
Topic	**Biology: Animals including Humans**
The Big Picture	In this unit, pupils are introduced to the six stages of the human life cycle: foetus, baby, child, adolescent, adult, and elderly adult. Pupils will learn about the key features of each stage, noting that babies, children, and adolescents experience rapid growth in mass and height, typically reaching a peak in adulthood. The unit also explores gestation periods in various mammals, leading pupils to understand that, generally, a longer gestation period correlates with a longer lifespan. Through these topics, pupils develop a comprehensive understanding of growth, development, and life cycles in both humans and other animals.
Key Knowledge	• The human life cycle consists of six stages: foetus, baby, child, adolescent, adult, and elderly adult. • Different mammals have varying gestation periods, which is the time a foetus develops inside the mother.
Enquiry Question	Are there patterns linking gestation periods and lifespans?
Enquiry Type	Pattern Seeking

Intended Learning

Lesson	**Learning Objective / National Curriculum link.**	**Skill Objective**	**Brief Overview**	**Key Vocabulary**	**Things to look out for**

1	**The human life cycles** Describe the changes as humans develop to old age.	Working scientifically – Explore ideas and raise different kinds of questions (non-statutory).	In this small step, children learn how humans grow and develop. They look at the six stages of the human life cycle − foetus, baby, child, adolescent, adult and elderly adult. Children briefly look at the key features of each stage of the human life cycle, but will explore each stage in more detail throughout this block. Encourage children to explore where they and other familiar people (such as teachers and family members) are within the life cycle. Children should understand that babies, children and adolescents grow rapidly in terms of mass and height. They tend to reach a peak in their growth when they become an adult. Children do not need to look at the stages of foetal development or the process of conception within this step, as this is covered in later curriculum.	Adolescent, baby, foetus, elderly adult, adult, life cycle	Children often think that a foetus grows in the mother's stomach rather than in the womb. Children may think a baby and a foetus are the same thing.
2	**Babies and children** Describe the changes as humans develop to old age.	Working scientifically – Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.	In this small step, children explore key milestones in baby and child development. They understand that babies are completely dependent on an adult to survive and will cry to communicate if they are hungry, uncomfortable, too hot or too cold. As a baby grows into a child most learn to walk, run, jump and eat independently. Most also communicate by talking and eventually learn to read and write. Children learn that both the mass and length of a baby changes drastically within their first year after birth. Children work scientifically by reading and interpreting data about the length and mass of babies. They will also plot a line graph to show how the length of a baby changes in their first months after birth.	Milestone, baby, toddler, child, womb,	Children may think that all babies hit milestones at exactly the same time. Children may think that all babies are the same length and mass when they are born.
3	**Adolescence and puberty** Describe the changes as humans develop to old age.	Working scientifically – Explore ideas and raise different kinds of questions (non-statutory).	In this small step, children explore adolescence and puberty in more detail. Children should understand puberty as the process of changing from a child to an adult. Puberty prepares humans for reproduction. Children learn that puberty can happen at any time between age 8 and 16 and they explore the key changes that happen to humans throughout puberty. In this step, children are introduced to the term "hormone" for the first time. At this stage, hormones are described as chemicals released by your body that cause both physical and emotional changes. Children should understand that puberty is controlled by hormones.	Adolescent, period, reproduce, puberty, hormone	Children may think that puberty begins at the same age for every person. Explain to children that it usually happens between the ages of 8 and 16. On average, girls start puberty two years before boys. Children may think that all physical changes happen quickly.

					Children should be aware that puberty is a gradual process that happens over several years.
4	**Adults and the elderly** Describe the changes as humans develop to old age.	Working scientifically – Identifying scientific evidence that has been used to support or refute ideas or arguments.	In this small step, children explore the key changes that happen to humans in adulthood and late adulthood. They learn that a human is categorised as an adult from the age of 18 and by this point rapid growth will have slowed down. The body is fully developed and ready to reproduce. Children learn about physical changes that happen to the body over time including loss of skin elasticity causing wrinkles, a reduction in height and the weakening of bones. They learn that humans are categorised as elderly adults from the age of approximately 65 and around this time the body gradually starts to slow down and movement may become more restricted.	Adult, elderly adult, reproduce, life expectancy	Children may think that all humans have the same life expectancy. Explain that life expectancy varies among humans for many different reasons such as health, sex and where you live. Children may think that all humans experience the same physical changes at the same time as they age. Explain that a variety of factors can influence this, such as exercise and keeping your brain active.
5	**Gestation periods of mammals** Describe the changes as humans develop to old age.	Working scientifically – recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.	In this small step, children explore the gestation periods of different mammals. Children should already understand that humans are classed as mammals because they are warmblooded, give birth to live young and feed their offspring on milk. Children learn that gestation is the period of time that a foetus develops in its mother's womb. In this step, they compare the gestation periods of different mammals such as humans, elephants, domestic cats, domestic dogs, blue whales and wild rabbits. Encourage children to identify any patterns seen in the data, such as "the larger the mammal, the longer the gestation period". Children begin a pattern seeking	Womb, foetus, gestation, mammal, offspring	Children may think that all mammals have the same gestation period. Usually, the larger the mammal the longer the gestation period. Clarify to children that there are some exceptions,

			enquiry in this small step 'Are there patterns linking gestation periods and lifespans?'		such as the blue whale's gestation period of 12 months compared to the African elephant's gestation period of 22 months.
6	**Gestation periods and lifespan** Describe the changes as humans develop to old age.	Working scientifically – Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations.	In this small step, children analyse data to explore whether there is a relationship between the gestation periods of animals and their lifespans. They should look at a range of different animals including African elephants, blue whales, domestic cats, domestic dogs, wild rabbits, horses and sheep. Children should conclude that the longer the gestation period of an animal, the longer the lifespan. However, humans are an anomaly because they have a relatively short gestation period compared to their lifespan. In this small step, children work scientifically by reporting and presenting findings from their enquiry and forming a conclusion as to whether there is a relationship between the gestation period of an animal and its lifespan.	Gestation, lifespan, correlation, anomaly	Children may think that there is no correlation between the length of an animal's gestation period and its lifespan. Usually, the longer the gestation period of an animal, the longer the lifespan. However, there are some animals that do not fit this pattern and have relatively short or long gestation periods compared to their lifespans.

Unit Summary	
Term	**Spring (4 Lessons)**
Topic	**Biology: Life Cycles**
The Big Picture	In this unit, pupils build on their existing knowledge of human life cycles and explore the distinct life cycles of various animal groups, including mammals, amphibians (such as frogs), insects, and birds. They will learn about the different stages each animal goes through from birth to adulthood and how these cycles can be similar or different across various species. This comprehensive exploration helps pupils grasp the diversity of life and the processes of growth and reproduction in the animal kingdom.
Key Knowledge	• Pupils learn that different animal groups, such as mammals, amphibians, insects, and birds, have distinct life cycles.

	• They can identify and describe the various stages within the life cycle of each animal group.
Enquiry Question	How are the life cycles of animals similar and how are they different?
Enquiry Type	Research

Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	Life cycles of mammals Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.	Working scientifically – Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas' (non-statutory).	In the previous block, children learnt about the life cycle of humans. In this block, they will build on this knowledge by exploring the life cycles of different animal groups, starting with mammals. Children have learnt that humans are classed as mammals and that mammals are warm-blooded vertebrates, have fur or hair on their bodies, give birth to live young and produce milk to feed their young. By the end of this small step, they will understand that a mammal has a similar life cycle to a human, which begins as a foetus in the mother's womb. Children should explore the four main stages of the life cycle of a mammal – foetus, young, adolescent and adult. In this block, children complete a research enquiry 'How are the life cycles of animals similar and how are they different?' Encourage children to start thinking about the enquiry question by discussing similarities and differences between the life cycles of humans and other mammals. Highlight to children that some mammals, called "monotremes", lay eggs instead of giving birth to live young.	Monotreme, offspring, mammary gland, mammal, life cycle	Children may think that humans are not animals and therefore are not classed as mammals.
2	Life cycles of amphibians (frogs) Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.	Working scientifically – recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.	In the previous small step, children learnt about the life cycle of mammals. In this step, they explore the life cycle of amphibians, with a focus on frogs. Children learnt about amphibians in previous year groups and should be able to describe an amphibian as an animal that lives both on land and in water. Remind children that amphibians lay eggs, which usually hatch and develop in water before emerging onto land when reaching the adult stage of the life cycle. Children should explore the metamorphosis of a frog, looking at frogspawn, tadpoles, froglets and adult frogs. Continue to encourage children to think about the enquiry question by discussing similarities and differences between the life cycles of mammals and amphibians.	Amphibian, frogspawn, tadpole, froglet, metamorphosis	Children may think frog eggs (frogspawn) have a hard outer covering like bird eggs. Explain that frogspawn has a soft jelly-like covering for protection instead of a hard shell.

3	Life cycles of insects Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.	Working scientifically − Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.	In the previous small steps, children have studied the life cycles of mammals and amphibians. In this step, they explore the life cycle of insects. Children should be able to describe an insect as a small animal that has three body sections and six legs. By the end of this step, they should be able to describe the four stages of the life cycle of an insect – egg, larva, pupa and adult. Children should explore the complete metamorphosis of different insects, such as a butterfly, honeybee and ladybird. Mention to children that some insects only go through three life stages (egg, nymph and adult) and this is called "incomplete metamorphosis". Continue to encourage children to think about the enquiry question by discussing similarities and differences between the life cycles of mammals, amphibians and insects.	Metamorphosis, larva, pupa, chrysalis, insect	Children may incorrectly classify spiders as insects. Spiders are classified as arachnids because they have eight legs and two body sections. Children do not need to be introduced to the term "arachnids" in Year 5 as this is introduced within the Year 6 curriculum.
4	Life cycles of birds Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.	Working scientifically − Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations.	In this small step, children explore the life cycles of birds. Children should be able to describe a bird as a vertebrate with feathers, wings and a beak. Children identify that birds lay eggs. By the end of this step, they should be able to describe the life cycle of a bird, including the five different stages – egg, hatchling, nestling, fledgling and adult. Children should look at different examples of birds that can fly, such as owls, and birds that cannot fly, such as penguins. At the end of this small step, children should have all the necessary knowledge to be able to answer the enquiry question. They will work scientifically by identifying similarities and differences between the life cycles of mammals, amphibians, insects and birds.	Birds egg, hatchling, nestling, fledgling, adult bird	Some children may think that eggs hatch into fully formed birds. Children may think that all birds build nests in trees. Show children examples of birds that construct nests on the ground, on cliffs and in burrows.

Unit Summary	
Term	**Summer (6 Lessons)**
Topic	**Biology: Reproduction A**
The Big Picture	In this unit, pupils are introduced to key concepts in reproduction. Pupils will learn about sexual reproduction in mammals, the different reproductive parts found in plants, and the process of pollination.
Key Knowledge	• Pupils will understand about sexual reproduction in mammals. • Pupils will identify the various reproductive parts in plants. • Pupils will understand the process of pollination in plants.
Enquiry Question	Which plant cutting produces the tallest plant?
Enquiry Type	Observation over time

Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**Sexual reproduction in mammals** Describe the life process of reproduction in some plants and animals.	Working scientifically – Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas (non-statutory).	In this small step, children are introduced to sexual reproduction for the first time. This builds on their knowledge from the previous block, in which they explored the life cycles of different animals. Children should be familiar with key words such as “offspring” and “foetus”. They should be able to recall that the foetus of a mammal grows inside the mother’s womb and that other animals, such as birds, fish and amphibians, lay eggs instead of giving birth to live young. By the end of this step, children should understand that fertilisation is the process by which a male sperm cell and female egg cell join to form a new life. They should also understand that sexual reproduction results in offspring that are not identical to the parents. Teachers should be mindful of cultural sensitivities when teaching this step and should ensure school policies are followed throughout.	Fertilisation, embryo, sperm cells, egg cells, sexual reproduction	Children may think that life begins once a baby is born. Children may think that a foetus grows in the mother’s stomach rather than the womb.
2	**Reproductive parts in plants** Describe the life process of reproduction in some plants and animals.	Working scientifically – Recording data and results of increasing complexity, using scientific diagrams and labels, classification keys, tables, scatter	In this small step, children build on their knowledge of flowering plants by exploring reproductive parts in more detail. In Year 3, children learnt that the male parts of a flowering plant are called “stamens” and the female parts are called the “pistil”. In this step, children learn the names and functions of the specific male and female reproductive parts in plants. The female pistil is made up	Anther, filament, ovule, stigma, style, ovary, pollen, pistil, stamen	Children may think plants are not “alive” and therefore do not reproduce.

		graphs, bar charts and line graphs.	of the stigma, style and ovary and the female sex cells are ovules. The male stamens are made up of the anther and filament and the male sex cells are pollen. In this step, children can work practically by carrying out a plant dissection to identify the reproductive parts of a flowering plant. To extend learning, children could dissect different types of flowering plants and compare the reproductive parts.		When dissecting the plants, children may find it difficult to identify the different reproductive parts. Using images may support with this identification.
3	**Pollination** Describe the life process of reproduction in some plants and animals.	Working scientifically − Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations.	In this small step, children explore the process of pollination in flowering plants. Children should recall from the previous step that the anthers and filaments make up the male parts of a flowering plant and the stigma, style and ovary make up the female parts. By the end of this step, children should understand that plants can reproduce sexually through pollination, building on their knowledge from Year 3. Children should be aware that many plants cannot pollinate themselves and that they rely mainly on pollinators or wind to transfer the pollen to other plants. Once the pollen grain has attached to the stigma, it travels down the style into the ovary and joins with an ovule – this is fertilisation. The fertilised ovule will then turn into a seed, which can then be dispersed to grow into a new plant.	Pollination, pollen, ovule, fertilisation	Children may not realise that most flowering plants have both male and female reproductive parts. Encourage them to look at the parts of the plants that they dissected in the previous step to see this.
4	**Asexual reproduction** Describe the life process of reproduction in some plants and animals.	Working scientifically − Identifying scientific evidence that has been used to support or refute ideas or arguments	In this small step, children build on their knowledge of reproduction by exploring asexual reproduction. They learn that asexual reproduction can occur with only one parent and results in offspring that are identical to the parent. These offspring are sometimes called “clones”. By the end of this step, children should be able to give examples of plants that can carry out asexual reproduction. Certain plants, such as daffodils and onions, can reproduce asexually by producing bulbs. Other plants, such as potatoes, create tubers. Bulbs and tubers stay beneath the soil and eventually develop into a new plant in the soil. Strawberries produce new plants at the ends of runners. An example of asexual reproduction in animals is starfish. Introduce children to the fact that humans have cloned animals, such as Dolly the sheep.	Clone, runner, tuber, bulb, asexual reproduction	Children may think that reproduction must involve two parents. Explain that asexual reproduction involves just one parent. Some plants, such as daffodils, can reproduce both asexually from bulb division and sexually from the flowers.
5	**Plan – clone plants**	Working scientifically − Planning different	In this small step, children begin to plan an observation over time enquiry to find out which parts of a parent plant	Independent variables,	Children may think that the plant

	Describe the life process of reproduction in some plants and animals.	types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.	are best for cloning a plant from. Geraniums are a good plant to use for this investigation. In the previous step, children explored asexual reproduction in plants. They were introduced to different methods of asexual reproduction, such as onions producing bulbs and strawberries producing runners. In this investigation, children should choose two different parts of the parent plant to use as cuttings to grow a new plant. Examples could include roots, stems, leaves or petals. In this step, children should plan their investigation and identify which parts of the parent plant they will use to try and clone plants. They should make a prediction as to which cutting will produce the tallest plant. 'Which plant cutting produces the tallest plant?'	controlled variables, dependent variables	part they use will determine the part of the plant that grows. For example, they might think that if they plant a leaf, then a leaf will grow. Children may require time to practise converting between centimetres and millimetres.
6	**Plant – clone plants** Describe the life process of reproduction in some plants and animals.	Working scientifically − Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.	In the previous step, children started an observation over time enquiry to clone a plant. They worked independently to plan an investigation to find out which parts of a plant were best to clone a plant from. In this small step, children begin their investigation by taking their cuttings from parent plants. Ensure they use equipment safely when taking their cuttings. They measure the initial length of their cuttings with a ruler. They should then plant the cuttings in some compost, using rooting powder or gel to encourage growth of the plants. The plants should be kept away from direct sunlight and should be covered with a clear plastic bag to keep them moist. Children should make observations and measure their cuttings over the next six weeks. They will measure the final length of their plants and present their findings from the investigation in Summer Block 4	Clone, cutting, parent plant, compost, asexual reproduction	Children may find it difficult to accurately measure the length of the cuttings with a ruler. Provide them with opportunities to practise this skill.

Unit Summary	
Term	**Summer (6 Lessons)**
Topic	**Chemistry: Reversible and Irreversible changes**
The Big Picture	In this unit, pupils focus on understanding how materials change and whether those changes can be undone. Pupils will first learn about dissolving, identifying soluble substances like salt and sugar that form solutions when mixed with a liquid, and insoluble substances such as sand and flour. They will also discover that increasing temperature and stirring can speed up

	dissolving. Building on this, the unit explores methods for separating mixtures: sieving for solids of different sizes and filtering for insoluble solids from liquids. Evaporation is then introduced as a way to recover a soluble solid from a solution. The curriculum then shifts to categorizing changes as either reversible or irreversible. Reversible changes, such as dissolving, mixing, and changes of state (freezing, melting, evaporation, condensation), are those where the original substances can be retrieved. Conversely, irreversible changes, like burning and reactions involving acids, result in the formation of new substances through chemical reactions and cannot be undone. Practical demonstrations and experiments, such as burning toast or mixing vinegar with bicarbonate of soda, will help pupils observe these concepts first hand.
Key Knowledge	• A soluble substance can dissolve in a liquid to form a solution, while an insoluble substance cannot. • Mixtures can be separated using methods such as sieving (for different-sized solids) and filtering (for insoluble solids from a liquid). • Evaporation can be used to separate a soluble solid from a liquid. • Reversible changes are those where the original substances can be retrieved, including dissolving, mixing, and changes of state (e.g., melting, freezing, evaporating, condensing). • Irreversible changes result in the formation of new substances (a chemical reaction) and cannot be undone, with examples including burning and reactions with acids.
Enquiry Question	Which changes are reversible and which are irreversible?
Enquiry Type	Identifying, grouping and classifying

Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**Dissolving** Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.	Working scientifically – Using test results to make predictions to set up further comparative and fair tests.	In this small step, children learn about the process of dissolving and explore the difference between soluble and insoluble substances. By the end of this step, children should know that a soluble substance can dissolve in a liquid to make a solution. Two examples of soluble substances are salt and sugar. Insoluble substances cannot dissolve in a liquid. Two examples of insoluble substances are sand and flour. Children should be aware that increasing the temperature of a liquid and stirring it will increase the rate at which soluble substances dissolve in it. Children should work scientifically by identifying whether a substance is soluble or insoluble and predict how other soluble substances behave.	Dissolve, soluble, insoluble, solution, substance	Children may think that when a substance dissolves in water it disappears. However, soluble substances are added to liquids to make a solution. Children may confuse dissolving with melting. When a substance dissolves, the solid is added to

					the liquid to make a solution, as opposed to melting, which is when a solid changes state to a liquid.
2	**Separate materials – filtering and sieving** Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.	Working scientifically – Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs	In this small step, children explore the processes of filtering and sieving, which are used to separate certain mixtures. This builds on knowledge from the previous step, where children looked at the difference between soluble and insoluble substances. This would be a good opportunity to recap the difference between solids, liquids and gases from the States of matter block in Year 4. By the end of this step, children will understand that sieving is a method of separating materials based on size by passing a mixture, such as pebbles and sand, through a sieve. Filtration is used to separate an insoluble solid from a liquid, such as separating sand from water. Evaporation will be covered in the next step. Children should work practically by filtering and sieving different mixtures, using a range of scientific equipment. They should be able to identify equipment, such as a sieve, funnel and filter paper.	Sieve, filter paper, mixture, insoluble, funnel, filtering	Children may think that filtering and sieving are the same thing. Completing simple tests will help children to notice the differences. Children may think that soluble substances can be separated by sieving or filtering. Solutions will just pass through the sieve or filter paper.
3	**Solutions and evaporating** Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.	Working scientifically − Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, and taking repeat readings when appropriate.	In this small step, children explore the process of evaporation and how this can be used to separate a soluble solid from a liquid. Children may be familiar with the term “evaporation” from the States of matter block in Year 4, when they looked at changes of state. Remind children that evaporation is the process of a liquid changing state to a gas. In the previous step, children focused on the process of sieving and filtering to separate insoluble solids from a mixture. They should understand that “soluble” refers to a substance that can dissolve in a liquid to make a solution. Children work practically in this step by using scientific equipment to separate a soluble solid from a liquid by evaporation. They should take measurements of the salt, water and the time it takes to retrieve the salt from the solution.	Solution, dissolve, soluble, insoluble, evaporation	Children may think that the liquid disappears when it evaporates. Clarify that the liquid has changed state to a gas, which is not visible. Children may confuse dissolving with melting. When a substance dissolves, the solid mixes with

					the liquid to make a new solution.
4	**Reversible changes** Demonstrate that dissolving, mixing and changes of state are reversible changes.	Working scientifically – Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas (non-statutory).	In this small step, children look at reversible changes. These are changes that can be reversed, such as dissolving and changes of state. If you can retrieve the substances that you started with, then the change is reversible. Children should be familiar with changes of state, because they explored this topic in the Year 4 States of matter block. It would be worthwhile to revisit this learning before introducing reversible changes. From previous steps in this block, children should be familiar with the concepts of dissolving and evaporating. In this step, children begin an identifying, grouping and classifying enquiry to identify and categorise different processes. Encourage children to make their own decisions about which observations are appropriate for identifying whether or not a change is reversible. Which changes are reversible and which are irreversible?	Mixture, states of matter, dissolve, reversible change, reverse	Children may think that all changes are reversible. Children may confuse dissolving with melting. When a substance dissolves, the solid mixes with the liquid to make a solution. Melting is a change of state from a solid to a liquid.
5	**Irreversible changes – burning** Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning, and the action of acid on bicarbonate of soda.	Working scientifically – Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas (non-statutory).	In the previous step, children identified reversible changes, such as changes of state, dissolving, and separating solid mixtures. In this small step, children look at changes that cannot be reversed. When substances cannot be changed back to how they were before the reaction took place, the change is irreversible. Some irreversible changes result in the formation of new materials, for example, burning. In this small step, children focus on the irreversible change of burning. Once a material has been burnt, it cannot be changed back to its original form. It is important that the children explore real-life examples, such as burning a match or the wick of a candle. Children should continue to think about the enquiry question in this step, by considering which changes are irreversible.	Chemical reaction, reversible change, irreversible change, burning, heating	Children may think that changing state produces a new substance. Children may think that heating and burning are the same processes. Allow children to link this to heating up food before eating it in comparison to burning a piece of toast.
6	**Irreversible changes – acid** Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible,	Working scientifically – Identifying scientific evidence that has been used to support or refute ideas or arguments.	In this small step, children continue to look at the idea of irreversible changes. Irreversible changes are changes that cannot be reversed. They are chemical changes, which means that at least one new substance is made. In this step, children will be looking at the reaction between an acid and bicarbonate of soda. For safety, the acid used for this reaction can be vinegar. The reaction of rocks with acid has already been explored in Year 3. Children should react an acid with bicarbonate of soda and find that it	Irreversible change, chemical reaction, vinegar, bicarbonate of soda	Children may be unsure about the difference between reversible and irreversible changes. Irreversible changes make

	including changes associated with burning and the action of acid on bicarbonate of soda.		fizzes. This means that a gas has been made. Fizzing is one sign that a chemical reaction has taken place, and a new substance (such as a gas) is made. Children should form an answer to the enquiry question within this step and should demonstrate their understanding of irreversible and reversible changes.		new substances. Reversible changes do not.

Unit Summary	
Term	**Summer (2 Lessons)**
Topic	**Sustainability: Plastic Pollution**
The Big Picture	In this unit, pupils explore the causes, impacts, and solutions related to plastic in the environment. Pupils will learn that plastic pollution occurs when humans introduce plastic into the environment. While plastics are useful due to their strength, lightweight nature, and mouldability, they pose a significant environmental threat because they can take hundreds of years to break down. The unit covers where non-recyclable plastic waste ends up, such as landfill sites and oceans, and its detrimental effects on animal and plant life. Pupils will understand how plastic pollution affects organisms in both ocean and land habitats, including the impact of microplastics being ingested by animals. Finally, the unit emphasizes achievable ways to reduce plastic pollution, encouraging pupils to consider using reusable items, selecting recyclable plastics, and opting for more environmentally friendly materials.
Key Knowledge	• Plastic pollution occurs when humans introduce plastic into the environment. • Plastics are useful because they are strong, lightweight, and mouldable, but they are harmful to the environment as they can take hundreds of years to break down. • Non-recyclable plastic waste frequently ends up in landfill sites or oceans, negatively affecting animal and plant life. • Plastic pollution impacts organisms in both ocean and land habitats, with microplastics (tiny pieces of plastic) being a concern as they can be ingested by animals. • Reducing plastic pollution can be achieved by using reusable items, choosing recyclable plastics, and opting for more environmentally friendly materials.
Enquiry Question	What is plastic pollution and what are the impacts of plastic pollution on planet Earth?
Enquiry Type	Sustainability
Intended Learning	

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**What is plastic pollution?**	Identifying scientific evidence that has been used to support or refute ideas or arguments.	In this small step, children explore the causes of plastic pollution. They should build on knowledge from the Spring term materials block where they identified different materials and their properties, including plastics. Children should understand that the properties of plastic make it a useful material. However, plastic can take hundreds of years to break down which can be harmful to the environment, animals and humans. To add context, it could be beneficial to discuss the waste bins in the local area. Differentiate between the recycling and household waste bins and explain where the waste from each bin ends up. Children should be able to state that non-recyclable plastic waste usually ends up in a landfill site or in the ocean. Children focus on the enquiry question 'What is plastic pollution and what are the impacts of plastic pollution on planet Earth?'	Plastic, habitat, plastic pollution, landfill, pollution	Children may believe that all plastics are recyclable. Show them examples of plastics that can be recycled or reused, such as water bottles and milk cartons, compared to single-use plastics such as balloons, straws and carrier bags.
2	**What are the impacts of plastic pollution on the planet?**	Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.	In this small step, children continue to explore plastic pollution, suggesting ways to reduce its negative impacts. It is important to show children the potential impacts on different habitats, particularly in the ocean and in or around landfill sites. It could be useful to use familiar food chains from Year 4, to introduce children to the fact that living things not directly exposed to plastic waste can still be affected by its pollution. By the end of this step, children should be able to explain how plastic pollution affects organisms in the ocean and on land. They should also identify achievable ways to reduce plastic pollution, such as using reusable bags, using recyclable plastic water bottles instead of buying bottled water and recycling and buying items made from more environmentally friendly materials.	Habitat, plastic, plastic pollution, microplastics, pollution	Children should understand that although plastic pollution harms sea life, humans are affected too. An effective way to introduce this could be explaining that landfill sites often release harmful gases and unpleasant smells near people's homes.

Unit Summary	
Term	**Summer (2 Lessons)**
Topic	**Biology: Reproduction B**
The Big Picture	In this unit, pupils focus on interpreting data related to plant reproduction, building on prior knowledge of plant cloning investigations. Pupils will analyse results from experiments where different plant parts were used as cuttings to create new clone plants. They will measure the final lengths of the plants and compare findings as a class, addressing the enquiry question through diagrams or written responses. This step also provides an opportunity to revisit the differences between asexual and sexual reproduction in plants. Furthermore, pupils will learn to interpret data, including line graphs, and understand that asexual reproduction involves only one parent, producing identical offspring. They will also have the chance to plan and carry out their own plant reproduction experiments, recording their findings in tables or graphs to draw conclusions and make predictions for future investigations.
Key Knowledge	• The unit revisits the difference between asexual and sexual reproduction in plants. • Asexual reproduction involves only one parent and produces offspring that are identical to the parent.
Enquiry Question	Which plant cutting produces the tallest plant?
Enquiry Type	Observation over time

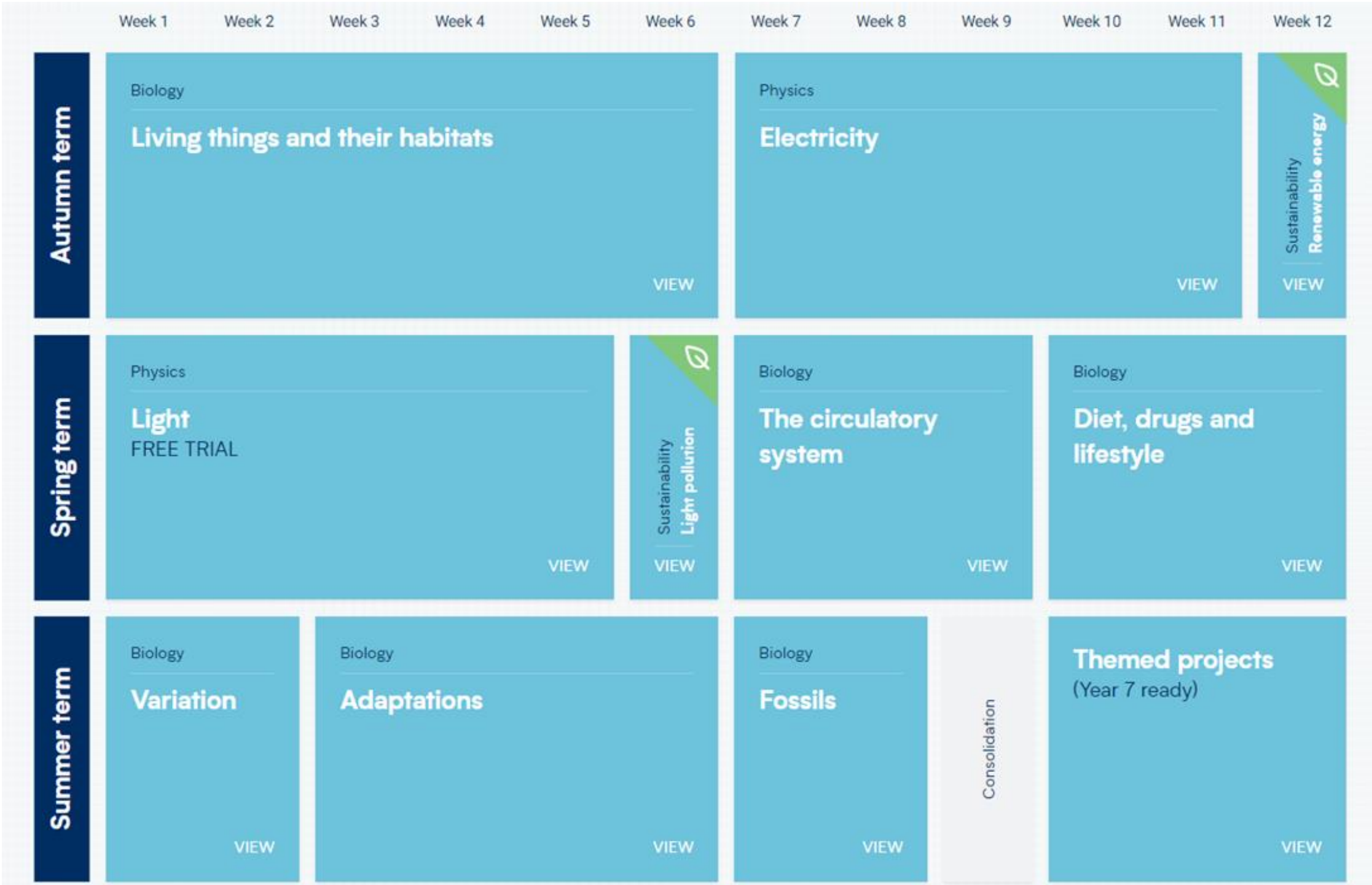
Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**Findings – clone plants** Describe the life process of reproduction in some plants and animals.	Working scientifically – Using test results to make predictions to set up further comparative and fair tests.	In this small step, children look at their results from the plant cloning investigation they started in summer Block 1. In the investigation, children chose different parts of a plant to use as cuttings to create new clone plants. They have observed changes in growth over time and should now measure the final length of the plants. Children should have the opportunity to compare and discuss results from the investigation as a class. They should also provide an answer to the enquiry question and this could be through diagrams or written responses. Which plant cutting produces the tallest plant? Children should be given the opportunity to think of questions for further investigation within this step. This step could also be used to recap the difference between asexual and sexual reproduction in plants.	Asexual reproduction, cutting, parent plant, data	Children may find it difficult to accurately measure the length of the plants with a ruler. Remove plants from the soil to measure the full length from the tip of the shoot to the point where the roots start to grow. Provide children with

					opportunities to practise this skill.
2	**Interpret data** Describe the life process of reproduction in some plants and animals.	Working scientifically − Using test results to make predictions to set up further comparative and fair tests.	In this small step, children work scientifically to interpret data from other plant experiments. Children have recently explored line graphs in maths. This step is an opportunity for them to plot a line graph to show the change in the height of a plant over time. Children should also be given the opportunity to create questions for further investigation in relation to reproduction in plants. If time allows, children should then carry out the investigations that have planned in small groups. Encourage children to create testable questions and logical experiment plans. Due to the time of year, children may be more confident to follow the enquiry process more independently.	Asexual reproduction, line graph, parent plant, prediction	Children may need support with maths skills during this step. Model how to choose appropriate intervals for both axes on their line graphs. Children should be encouraged to use a scale that will fill most of the space provided for their line graph. Discuss which would be the most appropriate scale for a graph prior to children undertaking this task.

Year 6

Autumn	Spring	Summer
Biology: Living things and their habitats Physics: Electricity Sustainability: Renewable energy	Physics: Light Sustainability: Light pollution Biology: The circulatory system Biology: Diet, drugs and life style	Biology: Variation Biology: Adaptations Biology: Fossils


Week 1
Week 2
Week 3
Week 4
Week 5
Week 6
Week 7
Week 8
Week 9
Week 10
Week 11
Week 12
Autumn term
Biology
Living things and their habitats
VIEW
Physics
Electricity
VIEW
Sustainability
Renewable energy
VIEW
Spring term
Physics
Light
FREE TRIAL
VIEW
Sustainability
Light pollution
VIEW
Biology
The circulatory system
VIEW
Biology
Diet, drugs and lifestyle
VIEW
Summer term
Biology
Variation
VIEW
Biology
Adaptations
VIEW
Biology
Fossils
VIEW
Consolidation
Themed projects
(Year 7 ready)
VIEW

Topic Context

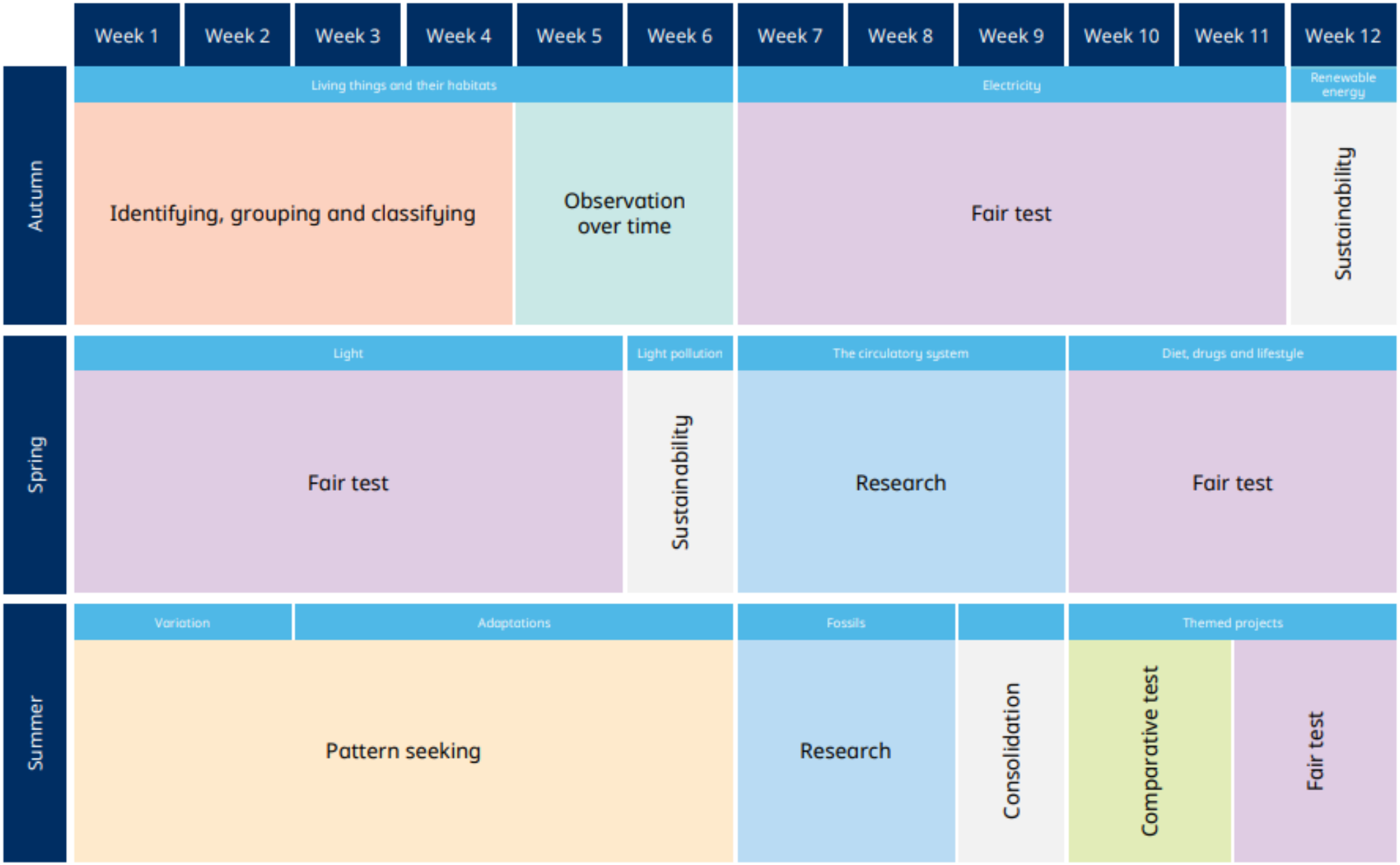
The Autumn Term begins with 'Living things and their habitats'. This decision builds on pupils' existing familiarity with animals and plants from previous year groups and their prior experience using classification keys in Year 4.

In the Spring Term, pupils will delve into two Physics blocks. They will start with 'Electricity' before moving on to a more in-depth exploration of 'Light'. 'Light' is placed in the Spring Term because it covers more abstract concepts that benefit from pupils' developing understanding.

The 'Circulatory System' and 'Diet, drugs and lifestyle' are taught across two separate blocks. This allows pupils to gain a deeper understanding of the circulatory system in the first block, before subsequently exploring how diet, drugs, and lifestyle choices can affect circulatory health.

In the Summer Term, the 'Evolution' block is divided into three smaller blocks. This extended focus is necessary due to the cognitive demand and the complexity of the language involved in these topics, ensuring pupils can grasp the challenging concepts effectively.

Enquiry Types Mapped



Unit Summary	
Term	**Autumn (7 Lessons)**
Topic	**Biology: Living Things and Their Habitats**
The Big Picture	In this unit, pupils are provided with a comprehensive exploration of how organisms are classified and identified. Pupils will begin by defining what constitutes a living organism, exploring the fundamental conditions required for life and distinguishing between living and non-living things. They will then delve into the process of classification, learning how scientists group animals (vertebrates and invertebrates, including specific vertebrate groups like mammals, birds, fish, amphibians, and reptiles) and plants (flowering and non-flowering, including deciduous, evergreen, and coniferous trees) based on their observable features. The unit also introduces pupils to the fascinating world of microorganisms (bacteria, viruses, and fungi), discussing their characteristics, and both harmful and helpful roles. The block culminates with pupils learning about Carl Linnaeus, the Swedish botanist who developed the first hierarchical system for classifying animals and plants, understanding how his ground breaking work laid the foundation for modern classification systems.
Key Knowledge	• Living organisms share characteristics like movement, reproduction, growth, and excretion, and have specific conditions for life. • Animals are classified as vertebrates (with a spine, e.g., mammals, birds, fish, amphibians, reptiles) or invertebrates (without a spine). • Plants are classified as flowering or non-flowering, and trees can be deciduous, evergreen, or coniferous. • Microorganisms (bacteria, viruses, fungi) are tiny living things with distinct features that can also be classified; some are helpful, others can cause disease.
Enquiry Question	How can animals, plants and microorganisms be identified, grouped and classified?
Enquiry Type	Identifying, grouping and classifying/ Observation over time

Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**Conditions for life** Describe how living things are classified into broad groups according to common observable characteristics and based on similarities	Working scientifically – Identifying scientific evidence that has been used to support or refute ideas or arguments.	In this small step, children explore requirements for life and the differences between living and non-living things. Requirements for life depend on the organism. An animal needs food, water, shelter, oxygen and space to survive. A plant has similar requirements but makes its own food, takes in water through its roots and needs sunlight to survive. Children need to understand the definition of living and non-living things so they are able to group organisms and objects. An animal is living because it can	Organism, excretion, reproduction, living, non-living	Children may think that animals move and plants do not. It is important to explain to them that parts of a plant do move towards sunlight.

	and differences, including microorganisms, plants and animals.		breathe, move, eat, grow, excrete and reproduce. A plant is living because its stem and other parts can move towards sunlight. It can make its own food, grow and reproduce.		Children may get confused when differentiating between living and non-living things. To address this, use examples of animals, plants and rocks and discuss with children why the examples are living or non-living.
2	**Group organisms** Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants, and animals.	Working scientifically – Use and develop keys and other information records to identify, classify and describe living things (non-statutory).	In this small step, children group animals and plants based on their features. Children recap different organisms including flowering and non-flowering plants, vertebrates (mammals, birds, fish, amphibians and reptiles) and invertebrates (including insects, spiders, slugs and snails). By the end of this step, children should be able to give examples of each type of organism and describe their features. This step introduces the enquiry question for this block. How can animals, plants and microorganisms be identified, grouped and classified? Children will be carrying out an identifying, grouping and classifying enquiry. They should think of ways that animals and plants can be grouped based on their features. It is important that children look at a range of animals and plants when grouping them.	Organism, vertebrate, invertebrate, flowering plant, non-flowering plant	Children may think that all animals in the sea are fish. Clarify to them that mammals, such as whales, are also found in the sea. Children may think that all plants have flowers. Remind them that some plants are non-flowering.
3	**Classify animals** Give reasons for classifying plants and animals based on specific characteristics.	Working scientifically − Use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment (non-statutory)	In this small step, children build on the grouping of organisms that they completed in Step 1. Children were introduced to classification keys in Year 4. Now they look at classification systems in more detail and discuss reasons why animals are placed in one category and not another. Children continue to explore the enquiry question in this step. They should develop their thinking by classifying a range of animals based on their features. It is important to encourage children to discuss and explain their reasoning using scientific facts, such as the number of legs.	Classification key, mollusc, arachnid, invertebrate, classification	Children may classify animals according to how they move or where they live. This can lead some children to classify animals incorrectly. For example, they may believe that whales are fish.

					Highlight to children that organisms are classified according to their features, such as number of legs or having scaly skin.
4	**Classify plants** Give reasons for classifying plants and animals based on specific characteristics.	Working scientifically − Use and develop keys and other information records to identify, classify and describe living things and materials and identify patterns that might be found in the natural environment (non-statutory).	In this small step, children use their prior knowledge of classification keys to create their own questions and classify plants. Children used classification keys to classify plants in Year 4. In this step, they classify both flowering and non-flowering plants. Although children have used the terms “deciduous” and “evergreen” in previous years, this is the first time they are introduced to the term “coniferous”. Children continue to explore the enquiry question in this step. They should be given a range of plants to classify using their own classification keys. It is important that children have opportunities to discuss and explain their reasoning when classifying plants.	Flowering plant, non-flowering plant, deciduous tree, evergreen tree, coniferous tree	Children may classify plants based on what they can clearly see, such as stem and flowers. For example, they may classify a mushroom as a plant by stating it has a stem. It is important to clarify to children what coniferous trees are and to provide examples such as pine trees.
5	**Microorganisms** Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals.	Working scientifically − Identifying scientific evidence that has been used to support or refute ideas or arguments.	In this small step, children explore microorganisms, including bacteria, viruses and fungi, for the first time. They may have a limited understanding of what microorganisms are. Children should be made aware that bacteria can be helpful and harmful. Friendly bacteria live in the stomach and aid digestion. Harmful bacteria can cause food poisoning and throat infections. Viruses may cause flu and the common cold. Fungi can cause infections in the mouth and throat. Some microorganisms are helpful and vital for humans to function properly. Children continue to explore the enquiry question in this step and they should be shown a variety of microorganisms so that they can identify the different shapes and types that exist.	Organism, microorganism, bacteria, virus, fungi	Children may think that all bacteria are harmful. State to them that humans have bacteria inside them which help to digest food. Children may believe that all microorganisms can be seen with the eye. Clarify to them that a powerful microscope is

					needed to view them.
6	**Classify microorganisms** Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals.	Working scientifically − Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations.	In this small step, children provide their answers to the enquiry question. They demonstrate their understanding by creating classification keys, grouping organisms or by giving written and verbal responses. Microorganisms can be classified according to their features, in the same way as animals and plants. The names of shapes of microorganisms should be limited to “has a tail” for bacteria, “complex and spherical-shaped” for viruses and “long, thin tubes” for fungi. This will make it easier for children to classify microorganisms because they will not have learnt the scientific names of shapes.	Microscope, organism, microorganism, classification, classification key	Children may think that microorganisms cannot be classified. Clarify that microorganisms can be classified based on their features, just as animals and plants can. Children may struggle to create questions for classification keys when classifying microorganisms. Create a whole-class question bank to help them to generate questions when constructing classification keys.
7	**Carl Linnaeus** Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals.	Working scientifically − Use relevant scientific language and illustrations to discuss, communicate and justify their ideas and should talk about how scientific ideas have developed over time (non-statutory).	In the final step of this block, children learn about the work of Carl Linnaeus and his system of classifying organisms. They have opportunities to research what Linnaeus did and how he classified organisms based on a hierarchical system. They will discover that because Linnaeus did not have all the information we have now, his system was not accurate. For example, he was not aware of the existence of microorganisms, and he did not classify reptiles as a separate vertebrate group. Children explore what impact Linnaeus’s work has on how organisms are classified today. This step provides an opportunity for children to collaborate, discuss and share ideas. They should present and compare their findings on the work of Carl Linnaeus.	Classification, characteristics, vertebrate, invertebrate, Carl Linnaeus	Children may think that Linnaeus created the classification system that we have today. Children may think that Linnaeus only classified animals. He created a classification system for plants also.

					Children should be aware that Linnaeus did not classify reptiles as a separate vertebrate group.

Unit Summary	
Term	**Autumn (6 Lessons)**
Topic	**Physics: Electricity**
The Big Picture	In this unit, pupils build upon their earlier understanding of circuits by focusing on constructing, drawing, and investigating series circuits. Pupils will learn to use recognized circuit symbols to represent components like cells, bulbs, switches, and buzzers accurately in diagrams. They will differentiate between complete and incomplete circuits, understanding that current only flows in a complete circuit. The unit explores how variations in components affect circuit function, observing that adding more bulbs or buzzers to a series circuit reduces their brightness or loudness. Finally, pupils will plan, conduct, and evaluate a fair test to investigate the relationship between voltage (increased by adding cells) and the loudness of a buzzer, developing their scientific enquiry skills in a practical context.
Key Knowledge	• They understand that current flows only in complete circuits and can identify reasons for incomplete circuits. • Adding more components (like bulbs or buzzers) to a series circuit decreases their brightness or loudness. • Increasing the voltage (by adding more cells) in a circuit increases the brightness of bulbs or the loudness of buzzers.
Enquiry Question	How does the voltage in a circuit affect the loudness of a buzzer?
Enquiry Type	Fair test

Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**Construct and draw series circuits using symbols** Use recognised symbols when representing a simple circuit in a diagram.	Working scientifically – Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter	In Year 4, children explored the basic concepts of electricity. They made and drew pictorial representations of circuits and components. In this small step, children build on their understanding of circuits to construct and draw series circuits using circuit symbols. Children should build circuits alongside their drawings to understand how the pictorial representation links to the physical example. It is essential that children draw circuits accurately. They	Series circuit, cell, battery, bulb, current, voltage	Children may draw pictorial representations of circuit components rather than symbols when drawing circuits.

		graphs, bar and line graphs.	should use a pencil and ruler, and draw the wires of the circuit as straight lines. In this step, children are introduced to the terms “current” and “voltage”. They should understand that current is the flow of electricity and voltage causes the current to flow.		When drawing circuits, children may think that wires should be drawn as “wiggly” lines. State to children that wires should be drawn as straight lines using a pencil and a ruler.
2	**Complete and incomplete circuits** Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches.	Working scientifically – Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.	In this small step, children look at complete and incomplete circuits. They explore reasons why a circuit may be incomplete. Reasons for a circuit to be incomplete include disconnected wires, cell terminals that are the wrong way round or an open switch. It is important that children use the term “current” when explaining why a circuit is complete or incomplete and why components may or may not work. They should understand that the current cannot flow when the circuit is incomplete. Children continue to draw and build circuits throughout this step.	Complete circuit, incomplete circuit, switch, buzzer,	Children may believe that when a circuit is incomplete, the electricity, or current, disappears or escapes from the circuit. Explain that a current does not flow at all in incomplete circuits and does not disappear or escape. Children may think that if all the components are in place, then the circuit is complete. Explain that even if all the components are in place, if the switch is open then the circuit is incomplete.
3	**Variations within circuits** Compare and give reasons for variations	Working scientifically − Recording data and results of increasing complexity using scientific diagrams and	In this small step, children explore variations within circuits and the effects of having fewer or more components. They construct a range of series circuits with varying numbers of components. Children should work methodically, adding one component at a time to a circuit	Series circuit, cell, bulb, current, voltage, buzzer	Children may find it difficult to compare the brightness if the circuits are not

	in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches.	labels, classification keys, tables, scatter graphs, bar and line graphs.	and observe any changes each time. It is important that children refer to electrical current when describing variations within circuits. They should spot patterns between the number of components and the brightness of bulbs and loudness of buzzers. Children should identify that when more bulbs or buzzers are added to a circuit, the components dim or get quieter, even if the voltage remains the same. Adding more components means that it is more difficult for the current to flow around the circuit. This is why the brightness of bulbs decreases when more are added.		next to each other. They should notice that one bulb is brighter than multiple bulbs.
4	**Plan – voltage experiment** Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.	Working scientifically − Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.	In the next three small steps, children work in small groups on the enquiry question for this block. 'How does the voltage in a circuit affect the loudness of a buzzer?' This is a comparative and fair testing enquiry. In this step, children plan how they will experiment with a circuit to find the answer to the question. Children were introduced to variables in Year 5. When planning this experiment, they should identify the "independent", "dependent" and "controlled" variables. They should identify the equipment they will use and explain why each piece is necessary. In Year 6, children do not need to use a voltmeter to measure voltage in a circuit, but they can increase voltage by adding more cells.	Independent variable, dependent variable, controlled variable	Children may confuse the variables when planning the experiment. They may need reminding of what each variable is and discussing this as a class or in small groups.
5	**Investigate – voltage experiment** Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.	Working scientifically − Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.	In this small step, children carry out the voltage experiment they planned in Step 4. To obtain valid results, a minimum of three cells should be used to assess whether voltage affects the brightness of a bulb and the loudness of a buzzer. When creating their series circuits, it is important that children check that all the components are connected properly. They should also draw associated circuit diagrams when constructing each circuit. They should carefully observe any changes in the loudness of buzzers as they increase the voltage, or number of cells.	Voltage, currant, repeatably,	Children might confuse the variables when completing their results table. Remind them that the independent variable is what will change, the dependent variable is what they will measure and the controlled variables are what will be kept the same. Children might not use correct circuit symbols. Remind them to use a

					pencil to draw the correct symbols and to draw wires as straight lines using a ruler.
6	**Evaluate – voltage experiment** Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.	Working scientifically – Using test results to make predictions to set up further comparative and fair tests.	In this small step, children look at their results from the voltage experiment. They should evaluate their results and suggest experiment improvements. Their results should show that an increase in the voltage, or number of cells, increased the loudness of the buzzer. When evaluating their experiment, children should refer to the "accuracy" of their experiment and think about how it could be improved. They could suggest using a data logger to measure the loudness of the buzzer. Children should think about how they could extend their investigation. This could be by using different types of cells or by using a different component, such as a bulb.	Repeatability, accuracy, evaluate	Children may confuse "accuracy" and "repeatability". Ensure they are confident with these terms, which are defined in the key vocabulary section. Children may state that they can improve their experiment by working with another person or group. Explain that it wouldn't improve the experiment scientifically.

Unit Summary	
Term	**Autumn (2 Lessons)**
Topic	**Sustainability: Renewable energy**
The Big Picture	In this unit, pupils are introduced to the crucial concept of sustainable energy sources and their environmental impact. Pupils will learn to distinguish between renewable energy sources (like solar and wind power, which do not run out) and **non-**renewable energy sources (like fossil fuels, which will eventually be depleted). They will explore how burning fossil fuels contributes to global warming and the emission of greenhouse gases. The unit focuses on the mechanisms of solar panels

	and wind turbines in generating electricity and highlights the advantages and disadvantages of each. Through practical activities, pupils will consider how to implement renewable energy strategies in their local communities and schools to mitigate the effects of global warming.
Key Knowledge	• Renewable energy sources (e.g., solar, wind) will not run out, unlike non-renewable fossil fuels. • Burning fossil fuels contributes to greenhouse gas emissions and global warming. • Solar panels convert sunlight into electricity, and wind turbines use wind to generate electricity. • Using renewable energy helps to limit the impact of global warming.
Enquiry Question	What is renewable energy and how can we use it to generate electricity?
Enquiry Type	Sustainability

Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**What is renewable energy?**	Working scientifically – Identifying scientific evidence that has been used to support or refute ideas or arguments.	In this small step, children learn about renewable energy and how it can be used to generate electricity. They compare the use of renewable energy to the burning of fossil fuels and the impact they have on the environment. Children have explored global warming in Year 5 but may need reminding of certain terms including “greenhouse gases”, “the greenhouse effect” and “climate change”. By the end of this step, children should understand the differences between renewable and non-renewable energy sources. They should identify that fossil fuels (coal, oil and natural gas) are non-renewable because they will eventually run out. Children explore how renewable energy, such as solar and wind power, is used to generate electricity. They also outline the advantages and disadvantages of non-renewable and renewable energy sources. What is renewable energy and how can we use it to generate electricity?	Solar power, wind power, renewable, non-renewable	Children may think there are no disadvantages to renewable energy sources. Highlight to children that there are some disadvantages of renewable energy sources, such as wind power being weather-dependent.
2	**Using renewable energy**	Working scientifically – Reporting and presenting findings from enquiries in oral and written forms such as displays and other presentations.	In this small step, children use their knowledge of renewable and non-renewable energy sources to look at the impact on the environment. By the end of this step, children should understand that using non-renewable energy sources such as coal, oil and natural gas is contributing to global warming. It is important that children research the different ways that renewable energy can be used to limit the impact of global warming. At the end of this sustainability block, children should consider how	Solar panels, wind turbine, global warming, greenhouse gases	Children may think that renewable energy sources are always expensive. Explain that wind and solar power technology has advanced and

			they could incorporate renewable energy strategies in their local communities and schools and provide reasons for doing so. What is renewable energy and how can we use it to generate electricity?		these energy sources are now cheaper than non-renewable energy sources. Some children may think that wind turbines pose a risk to birds. Highlight to children that wind turbines are not normally lethal to birds and that energy companies try is to minimise risk to wildlife.

Unit Summary	
Term	**Spring (8 Lessons)**
Topic	**Physics: Light**
The Big Picture	In this unit, pupils significantly expand on their prior knowledge of light and shadows from Year 3. Pupils will delve into how we see objects, understanding that light travels in straight lines from sources, reflects off objects, and enters our eyes. They will explore the formation of shadows in more detail, linking it to the straight-line travel of light and the properties of opaque, translucent, and transparent materials, including a practical investigation on how distance affects shadow size. The unit then introduces new concepts such as refraction, explaining how light bends when passing through different mediums, and concludes by exploring the composition of white light into a spectrum of colours (like a rainbow) using prisms, and acknowledging the historical contributions of scientists like Isaac Newton and Ibn Al-Haytham.
Key Knowledge	• Light travels in straight lines from light sources, reflects off objects, and then enters our eyes, allowing us to see. • Shadows are formed when opaque objects block light, and their shape is determined by the object's shape; pupils investigate how distance from a light source affects shadow size. • Refraction is when light bends as it passes from one medium to another due to changes in speed. • Scientists like Isaac Newton and Ibn Al-Haytham made significant discoveries about light.
Enquiry Question	How does the distance from a light source affect the size of the shadow?

Enquiry Type	Fair test				
Intended Learning					
Lesson	**Learning Objective / National Curriculum link.**	**Skill Objective**	**Brief Overview**	**Key Vocabulary**	**Things to look out for**
1	**How we see** Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes.	Working scientifically – Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas (non-statutory).	In Year 3, children were introduced to the concept of "light". They identified different light sources and explored how shadows are formed. In this small step, children explore how humans are able to see objects. Within this step, children name and identify simple parts of the human eye and discuss their functions in relation to being able to see objects. Children also explore the idea that some objects emit light while others reflect light. By the end of this step, children should identify that light travels from a light source to an object, then to the eye. The concept that light travels in straight lines will be covered in greater detail in Step 22	Light source, iris, retina, lens, pupil	Some children may think that light is emitted from our eyes. Explain that objects can be seen when the light from the object enters our eyes. Children may initially believe that we can only see objects that emit light, such as the Sun or a light bulb. Explain that not all objects emit light themselves. Instead, we can see objects that reflect light into our eyes.
2	**Light and straight lines** Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye.	Working scientifically – Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.	In this small step, children continue to explore the concept of how humans see objects. By the end of this step, children should identify that light travels in straight lines, but that it can change direction if it is reflected from an object. Within this step, children should draw simple ray diagrams to explain how light travels in straight lines from a light source to an object and is then reflected to the eye. Children should use a ruler to draw ray diagrams to show that light travels in straight lines. Children should explain that when light hits a smooth, shiny surface like a mirror, the rays reflect off the surface at the same angle at which they hit it. This change in direction allows us to see	Light source, reflection, ray diagram, angle, periscope	Children may not have experienced true darkness and therefore may think that we can see in the dark. Explain to children that if there is no light, then we cannot see anything.

			objects reflected in mirrors and other reflective surfaces. Children can demonstrate their understanding of this process through simple diagrams. They do not need to look at the concept of refraction in this step as it is covered later in the block.		
3	**Shadow formation** Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.	Working scientifically − Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.	In Year 3, children explored the idea of shadows and found simple patterns with how shadows are formed. In this small step, children use the fact that light travels in straight lines to look at how shadows are formed. They should determine that because light travels in straight lines, the shadow will be the same shape as the object that cast the shadow. Children may need to revisit the terms opaque, translucent and transparent. Within this step, children use opaque objects to produce shadows with different shapes. They should be encouraged to draw scientific diagrams to explain why a shadow has the same shape as the object that cast it. There are also opportunities to link to previous learning, where children looked at the Earth, Sun and Moon. They could explore the idea of a solar eclipse to explain that the Moon passes between the Earth and the Sun and blocks the sunlight from reaching the Earth. This casts a shadow of the Moon on the Earth.	Shadow opaque, translucent, transparent, solar eclipse	Children may think that shadows are always the same size. The shape and size of the shadow formed depend on the size of the object blocking the light and the angle of the light source.
4	**Plan – shadow experiment** Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.	Working scientifically − Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.	Over the next three steps, children undertake a fair test to explore whether the distance from a light source affects the size of the shadow. How does the distance from a light source affect the size of the shadow? Children should choose an opaque object and explore how the size of the shadow changes as the distance between the object and the light source increases. They should choose to measure either the length or the width of the shadow during each experiment attempt. The distance from the opaque object to a light source must be varied enough to create a measurable difference in the sizes of the shadows cast, but it must not be so close that the shadow is too large to measure. In this step, children plan their experiment and identify the independent, dependent and controlled variables. At this stage in Year 6, children should plan their experiment more independently.	Independent variables, controlled variables, dependent variables	Children may measure the length or width of a shadow that has been cast by another object. Care must be taken to ensure that the shadow is cast from the opaque object and not from other objects in the room. Children may need support converting between units, e.g., centimetres and millimetres.

5	**Investigate – shadow experiment** Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.	Working scientifically − Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.	In this small step, children carry out an investigation to see how the distance of an object from a light source affects the size of the shadow. In the previous step, children were encouraged to create an experiment plan more independently. Within this step, children set up practical equipment and make systematic and careful observations throughout. Children should use the distances they chose within the plan step. It is important that children are aware that the object will move but the position of the torch will remain the same. When conducting this experiment, the room must be dark so that the shadow can be easily seen. Additionally, the light source must be strong enough so that the experiment is not affected by light sources from other groups.	Light source, shadow, opaque	Children may choose an opaque object that is too large. State to them that the object should not be too large, as it will produce a very large shadow that is difficult to measure. Children may find it difficult to measure the size of the shadow. Care must be taken when measuring to ensure that the shadows from other light sources in the room are ignored.
6	**Evaluate – shadow experiment** Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.	Working scientifically − Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.	In this small step, children should be given the opportunity to answer the enquiry question and discuss how the distance from a light source affects the size of a shadow. Children should conclude that as the object is moved closer to the light source, the size of the shadow will increase. This is because the object blocks a larger portion of the light rays, resulting in a larger shadow. If the object is further away from the light source, the size of the shadow will decrease. This is because the object blocks less of the light, resulting in a smaller shadow. Children should be encouraged to draw scientific diagrams to explain their findings from this experiment. They should use the fact that light travels in straight lines as part of their explanations. By considering the straight-line path of light, they can accurately explain how the shadow's size changes when the object is moved closer to, or further away from, the light source.	Light source, shadow, opaque, conclusion, evaluate	Children are encouraged to draw a line graph to show their findings from this investigation. They may need support with drawing an accurate line graph to plot data.
7	**Refraction**	Working scientifically − Identifying scientific evidence that has	In this small step, children develop their knowledge and understanding of light travelling in straight lines from Step 2 to look at refraction. Up until this step, children have	Refraction, medium, transparent, lens	Children may become confused as to why light

	Recognise that light appears to travel in straight lines.	been used to support or refute ideas or arguments.	identified that light travels in straight lines. In this step, they explore how light can change direction when it travels from one medium to another. They should explore how refraction occurs and create simple explanations of why this happens. By the end of this step, children should explain that light passes through different materials at different speeds. For example, light travels faster through air than it does through water. When light moves from air to water, it slows down and that can cause it to change direction. This change in direction is what we call "refraction". Children should observe refraction first-hand using simple equipment such as a pencil in a glass of water or a transparent plastic block.		refracts. Clarify to them that light can change direction when it travels from one medium to another. Children may think the processes of refraction and reflection are the same. Recap reflection in this step and clarify how it is different from refraction.
8	**Explore light** Recognise that light appears to travel in straight lines.	Working scientifically − Talk about how scientific ideas have changed over time (non-statutory).	In this small step, children look at different properties of light and how some ideas about light were developed. Children explore the concept of "white light". In this step, children should identify how white light can be separated into different colours. They can use their understanding of refraction from Step 7 and use a prism to separate white light into its different colours. Children should identify that the prism changes the direction of each colour at slightly different angles. This allows us to see the colours individually. Within this step there is also an opportunity for children to research the work of influential scientists such as Isaac Newton. Children should identify that Newton made significant contributions towards the concept of the light spectrum. Through his experiments with prisms, Newton showed that when white light passes through a prism, it refracts and the different colours within the light spread out to form a spectrum.	Refraction, rainbow, prism, coloured filter, spectrum of light	Children may find it difficult to understand that white light is composed of different colours.

Unit Summary	
Term	**Spring (2 Lessons)**
Topic	**Sustainability: Light Pollution**
The Big Picture	In this unit, pupils focus on understanding the environmental impact of artificial light and how to mitigate it. Pupils will learn about the three main types of light pollution – glare (from bright light sources), light trespass (light shining where it's not

	wanted), and skyglow (brightening of the night sky). They will explore how light pollution negatively affects human behaviour (e.g., sleep patterns) and animal behaviour (e.g., migration, reproduction). The unit encourages pupils to identify sources of light pollution in their daily lives and collaboratively brainstorm and implement practical solutions within their school and communities to reduce light emissions, linking this to broader sustainability efforts and promoting responsible use of artificial light.
Key Knowledge	• Light pollution is the unwanted effect of artificial light, categorized into glare, light trespass, and skyglow. • It negatively impacts human sleep patterns and animal behaviours like migration and reproduction. • Reducing light emissions involves actions like turning off unnecessary lights and unplugging devices.
Enquiry Question	What is light pollution and how can we reduce it?
Enquiry Type	Sustainability

Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**What is light pollution?**	Working scientifically – Identifying scientific evidence that has been used to support or refute ideas or arguments.	In this sustainability block, children further their understanding of light by exploring light pollution and its impact on living things on Earth. What is light pollution and how can we reduce it? Children learn about three types of light pollution: glare, light trespass and skyglow. They should identify that glare results from artificial lights, such as car headlights, making it difficult to see. Light trespass occurs when light enters areas where it is not wanted, such as the windows of bedrooms where people are trying to sleep. Skyglow is a form of light pollution that brightens the night sky. Children should understand that light pollution affects human and animal behaviour, including sleep patterns in humans and migratory and reproductive patterns in other animals.	Migration, glare, light trespass, sky glow, light pollution	Children may not realise that artificial light confuses the circadian rhythm (our 24-hour internal clock) in both animals and humans. Children may not realise how light pollution can impact them. For example, exposure to light before bedtime impacts heavily on the quality of sleep.
2	**How can we reduce light pollution?**	Working scientifically – Reporting and presenting findings from enquiries, including conclusions,	In this small step, children continue to explore the concept of light pollution and look at ways that they can reduce light pollution in their local area. Children should be encouraged to think about their everyday routines and consider the changes that can be made in their schools	Urban, rural, light emission, appliance, light pollution	Children may think that light pollution is only an issue in cities, particularly if they

		causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations.	and communities. Children should also be encouraged to draw on learning from the different sustainability blocks and look at how light pollution is linked to other global issues. This will ensure that light pollution is not just seen as an isolated issue and that it is linked to many other areas of sustainability and sustainable living. By the end of this block, children should make small changes within their school setting to reduce the amount of light pollution and should understand why this has positive effects for living things.		live in a town or city and have less experience of rural environments or vice versa.

Unit Summary	
Term	**Spring (6 Lessons)**
Topic	**Biology: The Circulatory System**
The Big Picture	In this unit, pupils are provided with a comprehensive exploration of how the blood moves around the human body. Pupils will learn that the circulatory system comprises the heart, blood vessels (arteries, veins, capillaries), and blood, all working in unison. They will delve into the composition of blood (plasma, red and white blood cells) and understand the specific functions of each component, including oxygen and nutrient transport, and fighting infection. The unit focuses on the heart's role as a four-chambered pump, explaining how blood flows through it and distinguishing between oxygenated and deoxygenated blood. Finally, pupils will have the opportunity to observe or participate in a heart dissection, gaining first hand insight into the organ's physical structure and its contribution to circulation.
Key Knowledge	• The circulatory system transports blood throughout the body and is made of the heart, blood vessels (arteries, veins, capillaries), and blood. • Blood contains plasma (transports nutrients), red blood cells (carry oxygen), and white blood cells (fight infection). • The heart is a four-chambered muscle that pumps blood. • Oxygenated blood (from lungs) is pumped to the body, and deoxygenated blood (from body) is pumped to the lungs. • The left side of the heart is thicker as it pumps blood to the whole body.
Enquiry Question	What is the circulatory system and how does it work?
Enquiry Type	Research

Intended Learning

Lesson	**Learning Objective / National Curriculum link.**	**Skill Objective**	**Brief Overview**	**Key Vocabulary**	**Things to look out for**

1	**The circulatory system** Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.	Working scientifically − Explore ideas and raise different kinds of questions (non-statutory).	In Year 4, children learnt about the digestive system. In this small step, children are introduced to the circulatory system for the first time. Children should understand that the circulatory system is another system within our bodies that has a different overall function. In this step, children identify that the circulatory system is made up of the heart, blood vessels and blood, and that these work together to circulate blood around the body. Children should identify that there are three main types of blood vessel (arteries, veins and capillaries). Arteries take blood away from the heart, veins carry blood towards the heart and capillaries link arteries and veins together. The role of the heart and the difference between oxygenated and deoxygenated blood are concepts that are explored in later steps. Children are introduced to the enquiry question in this step and will carry out a research enquiry. What is the circulatory system and how does it work?	Circulatory system, heart, blood vessel, veins, arteries, capillaries,	Children may think that the circulatory system is one thing, rather than different parts working together. Children may confuse arteries, veins and capillaries.
2	**Blood** Describe the ways in which nutrients and water are transported within animals, including humans.	Working scientifically − Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas (non-statutory).	In the previous step, children have looked at an overview of what the circulatory system is and how the heart pumps blood around the body. In this small step, children look at the composition of blood more closely, and explore the other functions carried out by blood. By the end of this step, children should identify that blood is made up of plasma, red blood cells and white blood cells. They should understand that the main function of red blood cells is to carry oxygen from the lungs to the rest of the body. They should also know that plasma carries nutrients, water and other substances around the body and that white blood cells attack viruses and bacteria. Children learnt about viruses and bacteria in the autumn term, so this step can be used to further their understanding of microorganisms. What is the circulatory system and how does it work?	Red blood cells, white blood cells, lungs, nutrition, plasma, oxygen	Children may think that blood only has one function. Children may think that blood is only made up of red blood cells, because it is red.
3	**The heart** Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.	Working scientifically − Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas (non-statutory).	In this small step, children look at the heart and its function within the circulatory system. In Year 3, children were introduced to the term “muscles” and looked at their function within the body. In this step, children learn that the heart is a muscle. Children should explain that the heart is a pump and should understand that when the heart contracts, it pumps blood around the circulatory system, through the blood vessels. Show the children a cross-section of a heart, where they will see that it is made up of four chambers. They should identify that the heart is divided into two halves (right and left), each consisting of two chambers (atrium and ventricle).	Heart, atria, ventricles, left atrium, right atrium, left ventricle, right ventricle	Because children cannot control their heart, they may not realise it is a muscle. Children may think that the heart is one solid or empty vessel, rather than split

			Children will already be familiar with a lot of the vocabulary of this block, but the terms “atria” and “ventricles” will be new to them, so allow time to learn these words and what they refer to. Children will investigate the effects of exercise on heart rate in the next block.		into four different chambers.
4	**Blood flow in the heart** Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.	Working scientifically − Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas (non-statutory).	In this small step, children look at blood flow in the heart. Use this step to recap that the heart is a muscle and that it is made up of four chambers. Children should identify that the role of the heart within the circulatory system is to pump blood around the body. By the end of this step, children should understand that blood flows in one direction around the body and through the heart. They should be aware that there are valves within veins that stop blood from flowing backwards. Children should be able to explain that when blood flows into the heart, it flows into the atria at the top of the heart, then down into the ventricles, before leaving the heart again. Both the left and right sides of the heart pump at the same time, causing the heart to act as a double pump system. What is the circulatory system and how does it work?	Atria, ventricles, left atrium, right atrium, right ventricle, left ventricle, blood vessels, veins, arteries, capillaries	If children think of the heart as something that squeezes the blood, causing it to move, they may not understand why blood only moves in one direction. Children might think that blood flows from the top of the heart to the bottom of the heart purely due to gravity.
5	**Oxygenated and deoxygenated blood** Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.	Working scientifically − Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas (non-statutory).	In previous steps, children have learnt what the circulatory system is and the role of the heart within this system. Children should know that one of the key roles of blood is to take oxygen to all parts of the body. Blood that has high levels of oxygen in it is known as “oxygenated blood”. Once this oxygen has been taken to the parts of the body, the blood contains little oxygen and is now known as “deoxygenated blood”. Blood continues to flow around the body so that oxygenated blood can reach the parts of the body, and deoxygenated blood can travel to the lungs to receive more oxygen. Within this step, children should refer to the four chambers of the heart and should explain that the right side of the heart pumps deoxygenated blood to the lungs, while the left side of the heart pumps oxygenated blood to the rest of the body.	Lungs, blood vessels, veins, arteries, capillaries, oxygenated blood, deoxygenated blood	Children may think that because deoxygenated blood travels to the heart, that is where it becomes oxygenated. Children may think that deoxygenated blood is blue.
6	**Dissection of the heart** Identify and name the main parts of the human circulatory	Working scientifically − Reporting and presenting findings from enquiries, including conclusions, causal relationships	Children carry out or observe a heart dissection to learn more about the physical structures of the heart and how they help with its function. Remind children that the heart is split into four chambers. The left side of the heart is thicker than the right, meaning it is a stronger muscle, because it must pump with greater force in order to move	Heart, atria, ventricle, right atrium, left atrium, right ventricle, left ventricle, dissection	Children may confuse the roles of the left and right sides of the heart.

	system, and describe the functions of the heart, blood vessels and blood.	and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations.	oxygenated blood around the whole body. Note that some children may be sensitive about the dissection or may object on ethical, cultural or religious grounds. Also, it is essential to carry out a prior risk assessment. There are many ways in which you may show the children a dissection of the heart: either in person, at a workshop, in a video or simply through pictures. Children should be given the opportunity to form an answer to the enquiry question within this step.		Children may be confused about which sides of the heart we call the left and right sides. Children may not understand the significance of the left side of the heart being thicker than the right side.

Unit Summary	
Term	**Spring (6 Lessons)**
Topic	**Biology: Diet, drug and lifestyle**
The Big Picture	In this unit, pupils explore how various factors impact human body function, with a particular emphasis on health. Pupils will learn about the different types of fats and essential vitamins and minerals within a balanced diet, and understand the positive and negative effects of food and calorie intake on overall and heart health. The unit delves into the impact of various drugs, including painkillers, stimulants, and depressants, and differentiates between legal and illegal substances. A significant focus is placed on the dangers of smoking and vaping, identifying harmful components like tar, nicotine, and carbon monoxide, and their effects on the body, especially the heart and lungs. The unit culminates in pupils planning, investigating, and evaluating an experiment to determine how the duration of exercise affects heart rate, linking back to their knowledge of the circulatory system.
Key Knowledge	• A balanced diet, including various fats, vitamins, and minerals, impacts overall and heart health. • Different drugs (painkillers, stimulants, depressants) have distinct effects on the body. • Smoking and vaping contain harmful substances (tar, nicotine, carbon monoxide) that negatively affect the heart and lungs. • Exercise duration influences heart rate. • Diet, drugs, and lifestyle choices significantly impact how the human body functions.
Enquiry Question	How does the duration of exercise affect heart rate?
Enquiry Type	Fair test

Intended Learning					
Lesson	**Learning Objective / National Curriculum link.**	**Skill Objective**	**Brief Overview**	**Key Vocabulary**	**Things to look out for**
1	**Diet** Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.	Working scientifically – Identifying scientific evidence that has been used to support or refute ideas or arguments.	In this block, children explore the impacts of diet, drugs and lifestyle on overall body health. They should make links to learning in the previous circulatory system block as much as possible to identify how diet can have positive or negative effects on the heart. In Year 3, children explored the concept of a balanced diet and learnt about the five food groups. In Year 6, children should explore the impact of diet on overall heart health. They learn that fats can be classified as saturated, unsaturated and trans fats. Children should learn that the body needs vitamins (such as, A, C and D) and minerals (such as, iron and calcium). Children will encounter energy measured in calories and should research the impact of too many or too little calories on the body and how this also affects general and heart health.	Balanced diet, calories, unsaturated fats, saturated fats, trans fats	Children may think that humans cannot get all the vitamins and minerals needed for good overall health from the food we eat. Children may be sensitive when discussing diet and calories in Year 6 and it is important to be aware of this.
2	**Drugs** Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.	Working scientifically – Recognise which secondary sources will be most useful to research their ideas and begin the separate opinion from fact (non-statutory).	In this small step, children learn about drugs and their effects on the body. This includes different drugs, such as painkillers, depressants and stimulants. It is important to note that children may not have come across these terms before so they will need clarifying before they explore the effects on the body. Children should have opportunities to research different drugs, their effects and ask relevant questions to their peers and adults to further their understanding. By the end of this step, children should be able to give examples of different drugs and their effects on the body. They should also explore the difference between legal and illegal drugs. Refer to the school's PSHE policy when discussing this.	Drug, painkiller, stimulants, depressants	Children may believe that painkillers cure a person of a certain illness or condition. Explain to them that painkillers help to reduce pain. Children may believe that drugs relieve a person's stress and problems. Children may think that all drugs are bad for you. Clarify that some drugs are helpful and reduce symptoms or pain.

3	**Cigarettes** Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.	Working scientifically – Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact (non-statutory).	In this small step, children learn about cigarettes and vaping. This includes what cigarettes are made from, the dangers of smoking and vaping including their effects on the body. It is important that children look at the impact of smoking on the heart to allow them to recap knowledge learnt in the previous block. This is the first time that children have learnt about cigarettes and vaping. As a result, they may have some common misconceptions about them and their effects. It is important to note that children may not have come across terms such as tar, nicotine and carbon monoxide. They will need to know these terms before they can describe their effects on the body.	Cigarette, vape, tar, nicotine, carbon monoxide, addiction	Children may believe that a person must smoke for a long time before it has an adverse effect on the body. Children may have parents that smoke or vape and may be distressed by some of the information. Be mindful of this. Children may believe that if you are pregnant and smoke, then the mother's body protects the baby from the smoke.
4	**Plan – heart rate experiment** Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.	Working scientifically – planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.	In this small step, children plan a fair test to explore whether the duration of exercise affects heart rate. Children should be encouraged to use a plan proforma in small groups, so that they get support in making a prediction and create a logical experiment plan. Children should be introduced to the enquiry question. How does the duration of exercise affect heart rate? They should be aware of the terms "independent", "dependent" and "controlled" variables, however, the definitions of these terms may need to be recapped. They should then be able to identify the three variables in their experiment.	Independent variables, dependent variables, controlled variables	Children may confuse the variables in this experiment. Highlight and make clear to them what the independent, dependent and controlled variables are in this experiment. Children may think that only sport such as football or basketball is exercise. Clarify to them there are

					many different forms of exercise.
5	**Investigate – heart rate experiment** Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.	Working scientifically – Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.	In this small step, children carry out a fair test to explore how the duration of exercise affects heart rate. They should use their plans from the previous step to effectively carry out their investigation and obtain results for each duration of exercise. Before starting the investigation, it is essential that children are able to take their heart rate accurately. This should be practised prior to the investigation. Their heart rate can be easily found by placing two fingers in the centre of their wrist and pressing down slightly. Children could count the number of beats in 15 seconds and then multiply this number by 4 to calculate their beats per minute (bpm). Calculators may be used to support multiplying if children need extra support.	Circulatory system, heart, heart rate, duration, exercise	Children may need reminding before the investigation that heart rate must be taken before and after the exercise. Children may also need reminding that after each duration of exercise, the heart rate needs to return to normal before starting the exercise again.
6	**Evaluate – heart rate experiment** Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.	Working scientifically – Using test results to make predictions to set up further comparative and fair tests.	In this small step, children evaluate their heart rate experiment. They should work scientifically to analyse data, make conclusions and evaluate their experiment. Within this step, children should be given the opportunity to answer the enquiry question and discuss the effect of the duration of exercise on heart rate. They should discuss why their heart rate increases and link back to learning about the circulatory system in the previous block. Children could compare their data or results with other children to allow them to spot patterns and evaluate whether their results are similar or different. They should be aware of the term “anomalous results”, but this may need to be re-capped so they can identify any anomalous results in their data.	Heart, heart rate, duration, conclusion, evaluation	Children need to comment on scientific improvements when evaluating their experiments, such as improving accuracy and how this can be achieved. For example, children could use a heart rate monitor which is more accurate than counting beats per minute (bpm) as they could take the measurement during exercise rather than immediately afterwards.

Unit Summary	
Term	**Summer (2 Lessons)**
Topic	**Biology: Variation**
The Big Picture	In this unit, pupils are introduced to the concepts of variation and inheritance in living organisms. Pupils will learn that variation refers to the differences found among organisms, even within the same species. They will explore how inheritance plays a role, understanding that offspring are similar to their parents but not identical, as they inherit a mix of characteristics (features) from both. The unit delves into how humans can breed animals, like dogs, for desirable characteristics, leading to distinct breeds. Through various examples and activities, pupils will recognize that variation is a fundamental aspect of all species and understand how traits are passed down through generations.
Key Knowledge	• Variation refers to the differences found between individual organisms, even within the same species. • Inheritance is the process by which characteristics (features) are passed from parents to their offspring. • Offspring are similar to, but not identical to, their parents due to inheriting traits from both.
Enquiry Question	Is the type of food a bird eats related to the shape of its beak?
Enquiry Type	Pattern seeking

Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**Variation** Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.	Working scientifically – Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas (non-statutory).	In this small step, children are introduced to the term “variation” for the first time. They used the term “organism” in Autumn Block 1 and described an organism as a living thing. They now extend this to explore the term “species” as a group of similar organisms where two parents can reproduce to create offspring. They also learn that “variation” refers to differences between organisms. To explore the concept of variation, children should be given opportunities to look at variation between individuals of the same species and individuals of different species. Real-life examples or high-quality images can help children to identify variation between similar organisms.	Organism, variation, species, offspring	Some children may think that only animals such as humans, dogs and cats show variation. Clarify to them that organisms such as plants and microorganisms also show variation. Children may think that they are identical to one of their parents if

					they look similar. Explain to children that organisms that are produced through sexual reproduction make non-identical offspring.
2	**Inheritance and characteristics** Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.	Working scientifically − Recording data and results of increasing complexity, using scientific diagrams and labels, classification keys, tables, scatter graphs, bar charts and line graphs.	In this small step, children explore inheritance and characteristics for the first time. Children have looked at sexual reproduction in Year 5. They should be aware that offspring from sexual reproduction are similar to the parents but are not identical. Children should have opportunities to learn that human offspring inherit characteristics from their parents, such as hair colour, eye colour and skin colour. They should also explore the concept that other animals inherit characteristics from their parents. A simple way of exploring this concept is to discuss breeding in dogs. Humans can breed animals with desirable characteristics.	Characteristics, inheritance, desirable characteristics, offspring	Some children may believe that humans do not inherit hair colour from their parents, because we can dye our hair to change its colour. Clarify to them that the natural colour of human hair is inherited from our parents. In this step we are discussing biological families. Different children have different families. This topic is sensitive and knowledge of your children's family situations is beneficial.

Unit Summary	
Term	**Summer (6 Lessons)**
Topic	**Biology: Adaptations**
The Big Picture	In this unit, pupils explore how living organisms, both animals and plants, are uniquely suited to their environments. Pupils will investigate various animal adaptations (e.g., thick fur for cold climates, thin fur for deserts) and plant adaptations (e.g., long roots for desert survival) that enhance their chances of survival in specific habitats. A significant portion of the unit

	focuses on the concept of evolution, defined as the process where descendants develop different characteristics over long periods, eventually leading to new species. Pupils will learn about Charles Darwin and his ground-breaking "Theory of Evolution" through natural selection, understanding that organisms better adapted to their habitat are more likely to survive, reproduce, and pass on advantageous traits. This includes a detailed look at Darwin's finches and how their beak variations demonstrate natural selection.
Key Knowledge	• Adaptations are characteristics that help animals and plants survive in their specific habitats. • Evolution is the process where characteristics of living things change over very long periods, leading to new species. • Charles Darwin proposed the Theory of Evolution by Natural Selection. • Natural selection means organisms best adapted to their environment are more likely to survive, reproduce, and pass on their advantageous traits. • Darwin's finches demonstrate how beak shapes adapted to different food sources, illustrating natural selection.
Enquiry Question	Is the type of food a bird eats related to the shape of its beak?
Enquiry Type	Pattern seeking

Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**<u>Animal adaptations</u>** Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.	Working scientifically – Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact (non-statutory).	In this small step, children learn about animal adaptations. They should understand that adaptations are characteristics which improve the chances of survival in a habitat. They explore specific adaptations of various animals and how these adaptations allow them to survive in their habitats. Children should be given opportunities to compare and discuss how a range of animals such as penguins, polar bears, camels and desert foxes are adapted to survive in extreme conditions. These include both polar and desert environments.	Characteristics, adaptations, polar habitat, desert habitat, habitat	Children may think that animal adaptations such as camouflage occur because the animal has “chosen” to camouflage itself. State to them that the animal cannot “choose” this. Children may think that animals are able to adapt within their own lifetime. Children may believe that a camel’s hump stores water. The

					hump contains fat, which can break down to release energy and water.
2	**Plant adaptations** Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.	Working scientifically – Identifying scientific evidence that has been used to support or refute ideas or arguments.	In this small step, children explore how plants are adapted to survive in their habitats. They have already dissected and learnt about the functions of plant parts in Year 3. In this step, they build on this knowledge to describe and explain how longer roots and larger stems are specific adaptations for plants to survive in desert environments. Children may be familiar with cacti as plants that are adapted to survive in desert conditions. They could also study other types of desert plant, including agave and aloe plants. This would allow them to discuss similarities and differences between plants within the same habitat.	Characteristics, adaptation, variation, desert habitat, polar habitat	Children may think that cacti just have “spikes” and not leaves. Explain to them that cacti have spines or needles, which are a type of leaf, designed to reduce water loss. Children may believe that plants in deserts have the same size or length of roots as plants in a rainforest. Clarify that desert plants may have extremely long roots to help them absorb water.
3	**Evolution** Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.	Working scientifically – Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact (non-statutory).	In this small step, children learn about evolution. They learn that evolution is a process where descendants develop different characteristics from their ancestors, creating new species. Children should understand that evolution allows organisms to survive and adapt to their environments. In Year 6, children do not need to understand or use the terms “genes” and “chromosomes”. In this step, they learn that living things and their characteristics change over a long period of time. Give children examples of animals and plants that have changed over time and why they have needed to evolve, including the need to adapt to their environments or habitats.	Characteristics, adaptations, habitat, evolution	Children may think that evolution is a quick process. Children may believe that evolution causes animals and plants to be perfectly adapted to their environments. Explain that evolution causes animals and plants to be better

					adapted to their habitats. Children may think only animals have evolved adaptations to their environments. Clarify that evolution happens in all organisms.
4	**Charles Darwin** Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.	Working scientifically − Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and should talk about how scientific ideas have developed over time (non-statutory).	In this small step, children learn about Charles Darwin and his contributions towards the understanding of the process of evolution. Building on their knowledge of evolution from the previous step, they learn that different species of animals have evolved from a shared or common ancestor. Children do not need to know about Darwin's observations on the Galapagos Islands, as this is covered later in the block. Children are introduced to the enquiry question "Is the type of food a bird eats related to the shape of its beak?" They complete a pattern-seeking enquiry in this block. Children should be given opportunities to explore how a range of different animals have evolved from a common ancestor and what led to this evolution.	Charles Darwin, common ancestors, evolution, species, theory	Children might think that humans used to be monkeys. Humans did not evolve directly from modern monkeys, but both humans and monkeys share a common ancestor. Children may believe that humans were around at the same time as the dinosaurs. Clarify to them that was not the case.
5	**Natural selection** Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.	Working scientifically − Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact (non-statutory).	In this small step, children learn about natural selection for the first time. As stated in Step 3, children do not need to refer to "genes" or "chromosomes" when exploring natural selection. Instead, they should refer to the characteristics of animals and plants being passed on to the next generation. Children should understand that natural selection can lead to variation in characteristics within a species. This may lead to certain characteristics being more advantageous for survival and reproduction. An example of this is the peppered moth, where variations in colouration contributed to the moth's ability to survive in	Charles Darwin, natural selection, adaptations, habitat	Children may think that plants and animals choose to adapt to their environments or habitats by natural selection. Highlight to them that the plants and animals do

			its habitat. Children explore the enquiry question Is the type of food a bird eats related to the shape of its beak?		not choose to adapt. Children may think that evolution and natural selection is the same thing. Clarify that this is not the case and that natural selection is a cause of evolution.
6	**Darwin's Finches** Identify how animals and plants are adapted to suit their environment in different ways, and that adaptation may lead to evolution.	Working scientifically – Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations.	In this final step, children build on their previous knowledge of Charles Darwin and evolution to explore who he was, what he did and why his work was important. In addition, they specifically learn about Darwin's observations on the Galapagos Islands and his work on finches. Children should also provide answers to the enquiry question. They should demonstrate their understanding of evolution, natural selection and the work of Charles Darwin through both written and verbal responses. Ideas highlighted in the practical ideas section could be used to help children understand this concept further.	Galapagos Island, finch, adaptations, evolution, Charles Darwin	Children may think that the finches were the same species as they looked similar. Clarify that the finches were not the same species, but had a common ancestor. The Galapagos Islands were selected due to the diversity of its nature and the unique creatures that lived on the different islands.

Unit Summary	
Term	**Summer (3 Lessons)**
Topic	**Biology: Fossils**
The Big Picture	In this unit, pupils deepen their understanding of how fossils are formed and their significance as evidence for evolution. Building on prior knowledge from Year 3, pupils will revisit the process of fossilisation, learning that fossils are imprints in

	rock providing information about ancient living things. A key focus is on how fossils found from different historical periods demonstrate the concept of evolution, showing how living things have changed over millions of years, supporting theories like Charles Darwin's. The unit also introduces pupils to the life and discoveries of Mary Anning, a pioneering palaeontologist, and her contributions to our understanding of prehistoric life.
Key Knowledge	• Fossils are imprints in rock of ancient living things, formed over millions of years. • They provide evidence that living things have changed (evolved) over time. • Older fossils tend to be simpler, and newer ones more complex, supporting evolution. • Mary Anning was a significant palaeontologist whose discoveries contributed to our understanding of fossils and evolution.
Enquiry Question	How have fossils changed over time and does this provide evidence for evolution?
Enquiry Type	Research

Intended Learning

Lesson	Learning Objective / National Curriculum link.	Skill Objective	Brief Overview	Key Vocabulary	Things to look out for
1	**Fossil formation** Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.	Working scientifically − Identifying scientific evidence that has been used to support or refute ideas or arguments.	In this small step, children learn about fossils and how they are formed. They explored the process of fossilisation in Year 3. In this block, children revisit and deepen their understanding of fossilisation. By the end of this step, children should be confident in recalling that a fossil is the imprint in a rock of a living thing that lived a long time ago. Children are introduced to the enquiry question “How have fossils changed over time and does this provide evidence for evolution?”. This is a research enquiry. They should be given opportunities to explore how fossils formed during different periods of history have enabled scientists to gather evidence that supports the idea of evolution.	Fossil, rock, decompose, skeleton	Children may believe that all prehistoric animals are extinct because all that remains of them are fossils. However, some reptiles and birds alive today share common ancestors with prehistoric animals. Children may think that fossils are the actual animals or plants rather than an ancient cast or mold of them.

2	**Explore fossils** Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.	Working scientifically – Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and should talk about how scientific ideas have developed over time (non-statutory).	In this small step, children use their understanding of fossil formation to explore a variety of fossils and what scientists can learn from them. Within this step, children should recap that evolution is the process where descendants develop different characteristics to their ancestors, creating new species. Children should then link this learning to fossils, as fossils provide valuable evidence to show how organisms have evolved over time. Children continue to explore the enquiry question and should be provided with opportunities to look at fossils of different organisms so they can compare them.	Fossil, rock, Charles Darwin, evolution	Children may believe that fossils are not useful to scientists. They should understand that fossils can show us how animals and plants have changed over time. Children may think there is no link between fossils and evolution. Fossils can be found in older and newer rocks with physical similarities. This suggests that animals have changed or evolved over time.
3	**Mary Anning** Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.	Working scientifically – Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations.	In the final small step of this block, children learn about Mary Anning and her Jurassic fossil discoveries in south-west England. They should be given opportunities to research Mary Anning and her contributions to fossil exploration, including the challenges she faced. In this small step, children should provide answers to the enquiry question and should demonstrate their understanding of fossils, fossil formation and how fossils can be used to provide evidence for evolution through both written and verbal responses.	Fossil, rock, palaeontologist, Mary Anning, Skeleton	Children might think that only male scientists have made scientific discoveries. This is not the case, for example, Mary Anning made many important discoveries which have improved our understanding of fossils. Children may think there is no link between fossils and

					evolution. Fossils can be found in older and newer rocks with physical similarities and differences. This suggests that animals have changed or evolved over time.