

Science Curriculum

Our Trust and Academy intent with our Science curriculum is to encourage **love** of learning about Science by stimulating the children's interest and enthusiasm for the subject. We aim to ensure that children **learn** to expand their knowledge of the world around them and practice key scientific skills such as researching, working methodically, recording, categorising and considering the implications of their scientific knowledge. Children will work individually and as part of a team to carry out investigations. The aim being that the children's **lives** are enriched with increasing confidence in their own learning, the embedding of meta-cognitive techniques for deeper consideration of the topic, and an understanding of the importance of working together independently and collaboratively.

KS1	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year A	Living things and their habitats: Habitats	Animals including humans: Sensitive Bodies	Forces, Earth and Space: Seasonal Change	Materials: Use of Everyday Materials	Plants: Introduction to Plants	Making Connections: TBC
Year B	Animals including Humans: Comparing Animals	Materials: Use of Everyday Materials	Plants: Plant Growth	Animals including Humans: Life Cycles and Health	Living things and their Habitats: Microhabitats	Making Connections: TBC
LKS2	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year A	Materials: Rocks and Soils	Energy: Sound and Vibration	Living things and their Habitats: Classification and Changing Habitats	Energy: Electricity and Circuits	Animals including Humans: Digestion and Food	Making Connections: TBC
Year B	Plants: Plant Reproduction	Animals including Humans: Movement and Nutrition	Energy: Light and Shadows	Forces, Earth and Space: Forces and Magnets	Materials: States of Matter	Making Connections: TBC
UKS2	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year A	Energy: Light and Reflection	Energy: Circuits, Batteries and Switches	Living things and their Habitats: Classifying Big and Small	Living things and their Habitats: Life Cycles and Reproduction	Forces, Earth and Space: Earth and Space	Making Connections: TBC
Year B	Living things and their Habitats: Evaluation and Inheritance	Materials: Properties and Change	Materials: Mixtures and Separation	Forces, Earth and Science: Imbalanced Forces	Animals including Humans: Circulation and Exercise	Making Connections: TBC

Composite

At Wave Primary Academies, we use the Kapow Primary Science Curriculum, which aims to develop a sense of excitement and curiosity about natural phenomena and an understanding of how the scientific community contributes to our past, present and future. We believe this gives pupils the grounding they need to be able to successfully reintegrate, and provides the ground work for Key Stage 3. Whilst in our Regional AP provision, pupils do not transition into our Secondary provision except in very rare circumstances, we know that we need to prepare them for the Key Stage 3 in mainstream, or their permanent placement. This curriculum is designed to develop a complex knowledge of Biology, Chemistry and Physics, but also adopt a broad range of skills in working scientifically and beyond.

Key Stage 1

Year A

Unit 1A: Living Things and their Habitats - Habitats

Considering the life processes that all living things have in common, pupils classify objects into alive, was once alive or has never been alive. Pupils explore global habitats, naming plants and animals that can be found there. They learn how a range of different living things depend on each other for food or shelter. Pupils explore this further by creating food chains to show the sequence that living things eat each other for energy to grow and stay healthy.

Outcomes:

- ✓ Ask questions to further their knowledge.
- ✓ Recall some life processes, giving examples of how they apply to plants and animals.
- ✓ Classify objects into alive, never been alive and was once alive, giving reasons for their choices.
- ✓ Match different plants and animals to their habitats.
- ✓ Give examples of how animals use their habitat for food and shelter.
- ✓ Recall that plants produce their own food for energy.
- ✓ Name living things that are producers and place a producer at the beginning of a food chain.
- ✓ Use arrows to show the order in a food chain.

Learning Objectives	Learning Outcomes
To identify some of the characteristics of living things.	<ul style="list-style-type: none">• I can ask questions to find out what living things have in common.• I can name some of the life processes.• I can give examples of how life processes apply to plants and animals.

<p>To recognise the difference between things that are alive, were once alive or have never been alive. Working scientifically: To classify objects into groups.</p>	<ul style="list-style-type: none"> • I can recall some of the life processes. • I can name objects that are living, were once alive or have never been alive. • I can classify objects into groups, giving reasons for my choices.
<p>To identify plants and animals in different habitats.</p>	<ul style="list-style-type: none"> • I can name four different habitats. • I can match animals and plants to their habitats. • I can describe what a habitat is like.
<p>To identify how a habitat provides animals and plants with what they need to survive. Working scientifically: To carry out research to find answers to questions.</p>	<ul style="list-style-type: none"> • I can use a website to retrieve information. • I can name woodland plants and animals. • I can give examples of how animals use the woodland habitat for food and shelter.
<p>To recognise how animals and plants depend on each other.</p>	<ul style="list-style-type: none"> • I can name animals in a rainforest and ocean habitat. • I can recall that a plant produces its own food. • I can give examples of how animals and plants depend on each other.
<p>To recall how animals get their food from plants and other animals.</p>	<ul style="list-style-type: none"> • I can name a producer and place it at the beginning of a food chain. • I can name predators that prey on other animals. • I can use arrows to show the order of a food chain.

Unit 2A: Animals including Humans - Sensitive Bodies

Familiarising themselves with the basic parts of the human body, children investigate their senses through stimulating experiences that highlight how we interact with the world around us. They work scientifically, using their senses to make observations, spot patterns and use data to answer questions. They develop an understanding of how science can support those who have lost sensory function and consider how a firefighter uses their senses at work.

Outcomes:

- ✓ Draw and label human body parts.
- ✓ Identify the body parts associated with each sense.

When working scientifically, pupils who are **secure** will be able to:

- ✓ Compare and group body parts.
- ✓ Begin to recognise patterns in data and use these to answer questions.
- ✓ Record data in a table.
- ✓ Measure using non-standard units.

Learning Objectives	Learning Outcomes
<p>Knowledge To name parts of the human body.</p> <p>Working scientifically To sort body parts into groups.</p>	<p>Knowledge</p> <ul style="list-style-type: none"> • I can draw and label human body parts • I can identify some differences in animal body parts. <p>Working scientifically</p> <ul style="list-style-type: none"> • I can use sorting rings to group same and different body parts.
<p>Knowledge To name the body parts used for each sense.</p> <p>Working scientifically To spot patterns in data.</p>	<p>Knowledge</p> <ul style="list-style-type: none"> • I can draw and label the body parts used for each sense. <p>Working scientifically</p> <ul style="list-style-type: none"> • I can measure using cubes. • I can use patterns in data to answer a question.
<p>Knowledge To identify the body parts used for the sense of taste and touch.</p> <p>Working scientifically To use the senses to make observations.</p>	<p>Knowledge</p> <ul style="list-style-type: none"> • I can use my sense of touch to identify an object. <p>Working scientifically</p> <ul style="list-style-type: none"> • I can describe the taste of different foods. • I can record describing words in a table.
<p>Knowledge To identify the body parts used for the sense of smell and sight.</p> <p>Science in action To recognise that scientists are always making new discoveries.</p>	<p>Knowledge</p> <ul style="list-style-type: none"> • I can recall the body part used for smell. • I can recall the body parts used for sight. <p>Science in action</p> <ul style="list-style-type: none"> • I can understand the importance of research into sight.
<p>Knowledge To identify the body part used for the sense of hearing.</p> <p>Working scientifically To investigate how sound changes as you move further away.</p>	<p>Knowledge</p> <ul style="list-style-type: none"> • I can name the body part used for hearing • I can identify an object based on the sound it makes. <p>Working scientifically</p> <ul style="list-style-type: none"> • I can use my observations to answer a question.
<p>Knowledge To recognise how the senses are used in everyday life.</p> <p>Science in action To recognise the importance of the senses in certain jobs.</p>	<p>Knowledge</p> <ul style="list-style-type: none"> • I can list actions people take based on their senses. • I can name feelings people have based on their senses. <p>Science in action</p> <ul style="list-style-type: none"> • I can describe how a firefighter uses their senses.

Unit 3A: Forces, Earth and Space: Seasonal Change

Reflecting on their own experiences, children learn about the four seasons and the weather associated with each. Pupils explore how seasonal changes affect trees, daylight hours and our choices about outfits. They plan and carry out their own weather reports, considering the knowledge required for this job.

Outcomes:

- ✓ Name the four seasons in order and describe the typical weather in each.
- ✓ Name some activities and events in the four seasons.
- ✓ Describe the appearance of a tree's leaves in each season.
- ✓ Complete a pictogram and use it to answer simple questions.
- ✓ Recall that summer has the most daylight hours and winter has the least daylight hours.
- ✓ Recording data about the temperature across the four seasons.
- ✓ Label a map of the UK with capital cities and seasonal weather symbols.

Learning Objective	Learning Outcomes
To identify how the weather changes across the four seasons.	<ul style="list-style-type: none"> • I can name the four seasons. • I can name the twelve months of the year. • I can describe the expected weather patterns for each season.
To identify events and activities that take place in different seasons.	<ul style="list-style-type: none"> • I can name the four seasons. • I can suggest appropriate clothing to wear in different weather conditions. • I can sort activities and events into the correct seasons.
To know how trees change across the four seasons.	<ul style="list-style-type: none"> • I can name the four seasons in order. • I can describe the appearance of a tree's leaves in each season. • I can ask simple questions about my observations.
To recognise that daylight hours change across the four seasons. Working scientifically: To record data in a pictogram.	<ul style="list-style-type: none"> • I can recall which seasons have the most and fewest daylight hours. • I can gather and record data. • I can complete a pictogram. • I can use a pictogram to answer questions.
Working scientifically: To gather and record data about how seasons change over time.	<ul style="list-style-type: none"> • I understand that a thermometer measures temperature. • I can record data about the temperature in different seasons. • I can compare data collected over time.
To plan and carry out a weather report.	<ul style="list-style-type: none"> • I can label the capital cities of each country in the UK. • I can describe seasonal weather in the UK. • I can suggest ways to prepare for different weather conditions.

Unit 4A: Materials - Everyday Materials

Identifying the difference between objects and materials, children explore their surroundings to find examples of each. They work scientifically by planning tests, making observations and recording data. Pupils use results to answer questions and sort and group materials based on their properties.

Outcomes:

Pupils who are **secure** will be able to:

- ✓ Name objects and identify the materials they are made from.
- ✓ Recognise that objects are made from materials that suit their purpose.
- ✓ Recall that a property is how a material can be described.

When working scientifically, pupils who are **secure** will be able to:

- ✓ Sort objects based on the materials they are made from.
- ✓ Group objects based on their properties.
- ✓ Suggest ways to test materials for their properties.
- ✓ Make predictions and recognise whether they were accurate.
- ✓ Use their observations to answer questions.
- ✓ Begin to recognise if a test is fair.

Learning Objectives	Learning Outcomes
To identify everyday materials. Working scientifically: To sort objects into groups based on the materials they are made from.	<ul style="list-style-type: none">• I can name everyday materials.• I can identify the materials different objects are made from.• Working scientifically: I can sort objects into groups.
To recognise the difference between objects and materials.	<ul style="list-style-type: none">• I can name objects.• I can identify the material an object is made from.• I can explain the difference between objects and materials.
To describe the properties of materials.	<ul style="list-style-type: none">• I can recall that property refers to how a material can be described.• I can describe the properties of everyday materials.• I can recognise that objects are made from materials which suit their purpose.
To group materials based on their properties (absorbency). Working scientifically: To make observations and record data.	<ul style="list-style-type: none">• I can name the properties of materials.• I can sort materials into groups based on their properties.• Working scientifically I can describe and record what I notice.
To group materials based on their properties (waterproofness).	<ul style="list-style-type: none">• I can suggest ways to test the properties of materials.• I can make a prediction.• Working scientifically: I can recognise when my prediction does not match the results.

Working scientifically: To plan a test and suggest what might happen.	
To group materials based on their properties (toughness). Working scientifically: To answer questions based on results.	<ul style="list-style-type: none"> • I can describe how materials respond to pulling and tearing • Working scientifically: I can use my observations to answer questions. • Working scientifically: I can recognise if a test is fair.

Unit 5A: Plants - Introduction to Plants

Identifying the key features of a plant, children describe important structures and make comparisons between different plants. Pupils use investigative skills to record the growth of a plant over time and begin to reflect on factors that will affect its development. They begin to explore how plants are used by humans and grow their own herb garden.

Outcomes: (Available April 2024)

Learning Objectives	Learning Outcomes
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Unit 6A: Making Connections - TBC

Outcomes:

Learning Objective	Learning Outcomes
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Year B

Unit 1B: Animals including Humans - Comparing Animals

Studying both local and global animals, children recognise common features and use this information to make comparisons and begin to classify animals. Pupils collect data by surveying class pets, to then explore ways in which this information can be recorded. They develop their understanding of classification by comparing the dietary habits of different animals and use their knowledge and imaginations to take on the role of a zookeeper.

Outcomes: Available Feb 24

Learning Objective	Learning Outcomes
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Unit 2B: Materials - Use of Everyday Materials

Identifying the difference between objects and materials, children explore their surroundings to find examples of each. They work scientifically by planning tests, making observations and recording data. Pupils use results to answer questions and sort and group materials based on their properties.

Outcomes:

Pupils who are **secure** will be able to:

- ✓ Name objects and identify the materials they are made from.
- ✓ Recognise that objects are made from materials that suit their purpose.
- ✓ Recall that a property is how a material can be described.

When working scientifically, pupils who are **secure** will be able to:

- ✓ Sort objects based on the materials they are made from.
- ✓ Group objects based on their properties.
- ✓ Suggest ways to test materials for their properties.
- ✓ Make predictions and recognise whether they were accurate.
- ✓ Use their observations to answer questions.
- ✓ Begin to recognise if a test is fair.

Learning Objectives	Learning Outcome
To identify everyday materials. Working scientifically: To sort objects into groups based on the materials they are made from.	<ul style="list-style-type: none"> • I can name everyday materials. • I can identify the materials different objects are made from • Working scientifically: I can sort objects into groups.

To recognise the difference between objects and materials.	<ul style="list-style-type: none"> • I can name objects. • I can identify the material an object is made from. • I can explain the difference between objects and materials.
To describe the properties of materials.	<ul style="list-style-type: none"> • I can recall that property refers to how a material can be described. • I can describe the properties of everyday materials. • I can recognise that objects are made from materials which suit their purpose.
To group materials based on their properties (absorbency). Working scientifically: To make observations and record data.	<ul style="list-style-type: none"> • I can name the properties of materials. • I can sort materials into groups based on their properties. • Working scientifically: I can describe and record what I notice.
To group materials based on their properties (waterproofness). Working scientifically: To plan a test and suggest what might happen.	<ul style="list-style-type: none"> • I can suggest ways to test the properties of materials. • I can make a prediction. • Working scientifically: I can recognise when my prediction does not match the results.
To group materials based on their properties (toughness). Working scientifically: To answer questions based on results.	<ul style="list-style-type: none"> • I can describe how materials respond to pulling and tearing. • Working scientifically: I can use my observations to answer questions. • Working scientifically: I can recognise if a test is fair.

Unit 3B: Plants - Plant Growth

Using their prior knowledge of important plant structures, children explain what factors are needed for successful growth and compare how those needs vary across different plants. They grow plants from seeds and bulbs to ascertain the needs for initial development and compare this to the survival needs of plants in later growth phases. Pupils take their own measurements and reflect on historical examples to understand how conclusions can be drawn.

Outcomes: Available April 24

Learning Objectives	Learning Outcomes
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Unit 4B: Animals including Humans - Life Cycles and Health

Outcomes: Available April 24

Learning Objectives	Learning Outcomes
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Unit 5B: Living things and their Habitats - Microhabitats

Developing their understanding of scientific enquiry, pupils learn that scientists use a range of skills to answer questions. They discover that microhabitats provide what minibeasts need to survive and carry out a survey to find out where different minibeasts live in the school grounds. They practise asking scientific questions and follow a method to investigate which conditions woodlice prefer. Pupils explore the job role of a botanist by identifying flowering plants.

Outcomes:

Pupils who are **secure** will be able to:

- ✓ Identify and name a variety of plants and animals.
- ✓ Recall that minibeasts live in microhabitats.
- ✓ Describe microhabitats and their conditions.
- ✓ Describe how microhabitats provide for the basic needs of animals and plants.
- ✓ Describe the job role of a botanist.

When working scientifically, pupils who are **secure** will be able to:

- ✓ Group minibeasts and create simple classification keys.
- ✓ Ask questions and recognise that they can be answered in different ways.
- ✓ Gather and record data and use it to answer questions.
- ✓ Plan what observations to make in an experiment.
- ✓ Order the steps of a method.
- ✓ Describe the appearance of flowering plants.
- ✓ Use an identification chart to name flowering plants.

Learning Objectives	Learning Outcomes
Working scientifically: To classify a variety of minibeasts.	<ul style="list-style-type: none"> I can name a variety of minibeasts. I can recognise the different characteristics of minibeasts. I can sort minibeasts into groups based on my observations. Working scientifically: I can organise questions to create a simple classification key.
Working scientifically: To recognise how scientists answer questions.	<ul style="list-style-type: none"> I can recognise that scientists choose the most suitable way to answer questions. I can ask questions about worms. I can use an information text to find answers to questions.
To recognise that living things live in habitats to which they are suited. Working scientifically: To gather and record data to answer a question.	<ul style="list-style-type: none"> I can make close observations and use equipment safely. I can give examples of how microhabitats suit the needs of minibeasts. Working scientifically: I can gather data and record it in a survey.
Working scientifically: To ask questions and plan how to carry out an experiment.	<ul style="list-style-type: none"> I can ask questions about the conditions minibeasts prefer. I can suggest what observations to make. I can order the steps of a method.
Working scientifically: To carry out an experiment and record data in a table.	<ul style="list-style-type: none"> I can use a stopwatch. I can use tally marks to record results. I can use my results to answer a question.
To identify a variety of flowering plants. Science in action: To understand the role of a botanist.	<ul style="list-style-type: none"> I can recognise similarities and differences. I can use an identification chart to name flowering plants. I can describe the role of a botanist.

Unit 6B: Making Connections - TBC

Outcomes:

Learning Objectives	Learning Outcomes
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Lower Key Stage 2

Year A

Unit 1A: Materials – Rocks and Soils

Studying rocks and their properties, children learn how to classify rocks and identify how they were formed. They look at the work of palaeontologists to learn about fossil formation and use models to explore how fossils tell us about the past. Pupils investigate the physical properties of rocks and link these to their particular uses. Pupils also explore soil formation, separate soil using a sedimentation jar and test soil drainage.

Outcomes:

Pupils who are **secure** will be able to:

- ✓ Define the term 'rock'.
- ✓ Describe the appearance of different rocks; identifying both crystals and grains.
- ✓ Group rocks by their absorbency, hardness and reaction to acid rain (vinegar).
- ✓ List the different factors that break down rocks.
- ✓ Describe fossil formation and identify fossils in rocks.
- ✓ Describe the work of a palaeontologist.
- ✓ Name, describe and compare some different categories of soil.
- ✓ List some of the benefits of earthworms to the soil.
- ✓ Identify and describe the comparative size and weight of the layers in a sedimentation jar.

When working scientifically, pupils who are **secure** will be able to:

- ✓ Use a magnifying glass correctly to observe the appearance of a rock in detail.
- ✓ Use results to choose the appropriate rock type for a specific use, suggest a better choice of rock for a specific use and to predict how a rock will be affected by the weather.
- ✓ Research and present information on fossil formation using a single source.
- ✓ Use a model of the fossil record to determine the relative age of a fossil, to suggest how a living thing has changed over time and to suggest what living things were around in a certain era.
- ✓ Draw and label the bars on a bar chart.
- ✓ Accurately draw and label the layers of sediment in a sedimentation jar.

Learning Objective	Learning Outcome
Knowledge To group rocks using their appearance.	Knowledge <ul style="list-style-type: none">• I can define the term 'rock'.• I can describe the appearance of different rocks.• I can identify crystals and grains.
Working scientifically To observe the appearance of rocks	Working scientifically <ul style="list-style-type: none">• I can use a magnifying glass correctly.

<p>closely, using a magnifying glass.</p>	<ul style="list-style-type: none"> • I can observe the appearance of a rock in detail.
<p>Knowledge To group rocks using their physical properties.</p> <p>Working scientifically To use the results for the physical properties of rocks to make predictions, suggest improvements and explain observations over time.</p>	<p>Knowledge</p> <ul style="list-style-type: none"> • I can group rocks by their absorbency. • I can group rocks by their reaction to acid rain (vinegar). • I can group rocks by their hardness. <p>Working scientifically</p> <ul style="list-style-type: none"> • I can use my results to choose the appropriate rock type for a specific use. • I can use my results to suggest a better choice of rock for a specific use. • I can use my results to predict how a rock will be affected by the weather.
<p>Knowledge To describe the process of fossil formation.</p> <p>Working scientifically To present research on fossil formation.</p>	<p>Knowledge</p> <ul style="list-style-type: none"> • I can list the different factors that break down rocks. • I can use a model to demonstrate fossil formation. • I can use a short film to sequence the steps of fossil formation. <p>Working scientifically</p> <ul style="list-style-type: none"> • I can research fossil formation using a single source. • I can present my research in short film form.
<p>Knowledge To identify fossils and group rocks accordingly.</p> <p>Working scientifically To use the fossil record to answer questions about the past.</p>	<p>Knowledge</p> <ul style="list-style-type: none"> • I can identify fossils in rocks. • I can group rocks that contain fossils. • Science in action: I can briefly describe the work of a palaeontologist. <p>Working scientifically</p> <ul style="list-style-type: none"> • I can use a model to determine the relative age of a fossil. • I can use the fossil record to suggest how a living thing has changed over time. • I can use the fossil record to suggest what living things were around in a certain era.
<p>Knowledge To compare soils and how they were formed.</p> <p>Working scientifically To record the drainage rate for different soils in a bar chart.</p>	<p>Knowledge</p> <ul style="list-style-type: none"> • I can name some different types of soil. • I can describe some different types of soil. • I can compare and group soils according to their appearance. <p>Working scientifically</p> <ul style="list-style-type: none"> • I can draw the bars on a bar chart. • I can label the bars on a bar chart.

<p>Knowledge To describe a soil sample using sedimentation.</p> <p>Working scientifically To draw and label a diagram.</p>	<p>Knowledge</p> <ul style="list-style-type: none"> • I can list some of the benefits of earthworms to the soil. • I can identify the layers in a sedimentation jar. • I can describe the size of the particles in a sedimentation jar. <p>Working scientifically</p> <ul style="list-style-type: none"> • I can accurately draw the layers of sediment in a sedimentation jar. • I can accurately label the layers of sediment in a sedimentation jar.
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Unit 2A: Energy - Sound and Vibration

Exploring different ways of producing sounds, children learn about the relationship between vibrations and what they hear. They use examples of dolphins and whales to develop their understanding of how sound travels between objects and investigate the role of insulation to protect our ears. Pupils explore how pitch and volume can be altered and make their own musical instruments to demonstrate these principles.

Outcomes: Available Feb 24

Learning Objective	Learning Outcome
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Unit 3A: Living Things and their Habitats - Classification and Changing Habitats

Identifying different ways living things can be grouped, children make classification keys to explore which grouping methods are most effective. Pupils study ways that habitats may change over time and understand that humans can have both positive and negative effects on their surroundings. They play the role of naturalists and review the impact of conservation programmes.

Outcomes: Available April 24

Learning Objective	Learning Outcome
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Unit 4A: Energy - Electricity and Circuits

Exploring appliances that use electricity in their setting, children learn how to work with electricity safely and build circuits. Pupils investigate electrical conductors and insulators and explore the relationship between the number of bulbs and bulb brightness. Real scenarios and historical discoveries inform children about scientific progression and home safety.

Outcomes:

Pupils who are **secure** will be able to:

- ✓ Recall a range of electrical appliances and classify them as mains or battery-powered.
- ✓ Explain why something is either mains or battery-powered.
- ✓ Explain how to test if a circuit works and identify when simple electric circuits will work.
- ✓ Identify symbols for open and closed switches.
- ✓ Predict whether a circuit will work based on whether the switch is open or closed and explain that it works by breaking and completing a circuit.
- ✓ Give examples of how switches are useful.
- ✓ Describe that a material is a good electrical conductor when it is added to an electric circuit and the bulb lights.
- ✓ Describe that a material is a good electrical insulator when it is added to an electric circuit and the bulb does not light.
- ✓ Recall that metals, for example, are good electrical conductors and plastics, for example, are good electrical insulators.
- ✓ Describe that the more bulbs added to a series circuit, the dimmer the bulbs will be.
- ✓ Explain that the bulbs will be dimmer when more are added to a circuit, as less energy is transferred to each of them.
- ✓ Describe precautions for working safely with electricity.
- ✓ Explain some precautions using knowledge of circuit diagrams, electrical components, conductors or insulators.

When working scientifically, pupils who are **secure** will be able to:

- ✓ Draw a results table and record a range of appliances under the correct headings 'Mains' or 'Batteries'.
- ✓ Identify and draw simplified electric circuit symbols and use these to draw a simplified circuit diagram.
- ✓ Write a method for the investigation that considers appropriate equipment, ordering clearly written steps and considering safety.
- ✓ Pose questions relating to bulbs in an electrical circuit.
- ✓ Explain why a selected question is testable.
- ✓ Suggest that new inventions will change safety advice.

Learning Objective	Learning Outcome
To recognise how electrical appliances are powered.	<ul style="list-style-type: none">• I can identify if something is an electrical appliance or not.• I can classify an electrical appliance as mains or battery-powered.

<p>Working scientifically: To record and classify qualitative data.</p>	<ul style="list-style-type: none"> • Working scientifically: I can record results under the correct headings in a table. • Working scientifically: I can group electrical appliances based on their power supply.
<p>To construct an electrical circuit.</p> <p>Working scientifically: To draw a scientific diagram.</p>	<ul style="list-style-type: none"> • I can identify components in a circuit. • I can build a circuit using a battery and a bulb. • I can explain how to test if a circuit works or not. • Working scientifically: I can draw symbols for the electrical components. • Working scientifically: I can draw a circuit diagram.
<p>To explain the use of switches in a circuit.</p>	<ul style="list-style-type: none"> • I can identify the symbol for a switch. • I can predict whether a circuit will work by observing whether the switch is open or closed. • I can explain how a switch works. • I can explain why switches are useful.
<p>To explain the use of materials as electrical conductors or insulators.</p> <p>Working scientifically: To write a method.</p>	<ul style="list-style-type: none"> • I can describe how to test whether a material is a good electrical conductor or insulator. • I can recall which groups of materials are good electrical conductors or insulators. • Working scientifically: I can write a safe method in chronological order, using clear instructions and appropriate equipment.
<p>To investigate what affects bulb brightness.</p> <p>Working scientifically: To pose questions and plan ways to test them.</p>	<ul style="list-style-type: none"> • I can describe how the number of bulbs in a series circuit affects bulb brightness. • I can explain why bulb brightness is affected by the number of bulbs. • Working scientifically: I can pose a question about bulbs in an electrical circuit. • Working scientifically: I can suggest ways of answering a question. • Working scientifically: I can explain why a question is testable.
<p>To explain how to be safe around electricity.</p> <p>Science in action: To explore how scientific advances inform safety advice.</p>	<ul style="list-style-type: none"> • I can describe precautions for working safely with electricity. • I can use scientific knowledge to explain why safety rules are in place. • Science in action: I can recall that inventing new materials or appliances may change safety advice.

Unit 5A: Animals including Humans - Digestion and Food

Using models, children describe the function of key organs in the digestive system. Pupils identify the types of human teeth to create their own model and investigate factors that impact our dental health. They compare human teeth to other animals' and consider this in the

light of prior knowledge about predators, prey and food chains. Children take on the role of a naturalist investigating animal faeces for clues about diet, digestion and dentition.

Outcomes:

Pupils who are **secure** will be able to:

- ✓ Label key organs found in the digestive system and describe each of their functions.
- ✓ Describe the functions of the four different types of adult human teeth, using key vocabulary.
- ✓ Know that good dental care involves brushing their teeth twice a day with toothpaste and a soft toothbrush.
- ✓ Produce a food chain that begins with a plant and has arrows that move up the food chain.
- ✓ Define a producer, predator and prey and identify examples in food chains.
- ✓ Describe digestion, teeth and diets when talking about the observed poo clues.
- ✓ Write a letter that uses a range of scientific vocabulary from the unit.

When working scientifically, pupils who are **secure** will be able to:

- ✓ Evaluate a strength or weakness of the digestive system model.
- ✓ Describe an example of evidence that can be used to study teeth.
- ✓ Identify some of the variables that need to be kept the same, predict an outcome and identify limitations to the experiment.
- ✓ Recall that scientific research needs repeated results before use in society.
- ✓ Identify trends in a predator-prey graph.
- ✓ Draw a results table that has space for observations about different poo samples.

Learning Objective	Learning Outcome
<p>To describe the function of the human digestive system.</p> <p>Working scientifically: To evaluate a model.</p>	<ul style="list-style-type: none"> • I can list the main organs of the human digestive system. • I can describe the function of the main organs of the digestive system. • I can explain how a model has been used to show a part of the digestive system. • Working scientifically: I can identify a weakness in the model used to represent the digestive system.
<p>To recognise the different types of human teeth and their roles in eating.</p> <p>Science in action: To describe real observation methods and evidence collected.</p>	<ul style="list-style-type: none"> • I can recall the four types of human teeth. • I can explain what the different teeth are used for. • Science in action: I can identify how scientists find out about teeth.
<p>To explain how to care for our teeth.</p>	<ul style="list-style-type: none"> • I can recall factors that damage teeth. • I can identify the best toothbrush to use when brushing your teeth.

<p>Working scientifically: To plan an enquiry by considering which variables should be changed, measured and controlled.</p> <p>Science in action: To determine why scientists need to work collaboratively and evaluate experiments.</p>	<ul style="list-style-type: none"> • Working scientifically: I can plan a fair test by selecting which variables need to be changed, measured and controlled in an experiment. • Science in action: I can describe some steps involved in real scientific testing
<p>To recognise that differences in teeth relate to an animal's diet.</p> <p>Working scientifically: To classify animals based on their diet.</p>	<ul style="list-style-type: none"> • I can describe what different types of teeth are used for. • I can recall different types of animal diets. • I can construct a food chain. • Working scientifically: I can use evidence when classifying animals.
<p>To recognise producers, predators and prey in food chains.</p> <p>Working scientifically: To analyse trends in line graphs and form conclusions using scientific knowledge.</p>	<ul style="list-style-type: none"> • I can identify a producer, a predator and prey. • I can explain population changes using scientific ideas. • Working scientifically: I can begin to analyse predator-prey graphs. • Working scientifically: I can predict missing values from data.
<p>To recognise that animal poo can give us clues about digestion, teeth and diet.</p> <p>Working scientifically: To construct a results table for recording observations.</p>	<ul style="list-style-type: none"> • I can describe what an herbivore, carnivore and omnivore are. • I can look for clues in poo. • I can explain why poo is useful evidence. • Working scientifically: I can draw a results table and record observations.

Unit 6A: Making Connections - TBC

Outcomes:

Learning Objective	Learning Outcome
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Year B

Unit 1B: Plants - Plant Reproduction

Building on their prior knowledge of plant structures, children describe the functions of named parts and use evidence to explain their significance in plant development. Pupils investigate further factors that may affect the growth of plants and compete with their peers to disperse seeds in a variety of ways. They explore how seeds vary and define the type of plant they are studying, as well as looking at how seed shapes have inspired modern technologies.

Outcomes: Available April 24

Learning Objective	Learning Outcome
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Unit 2B: Animals including Humans - Movement and Nutrition

Studying the human skeleton, children identify key bones and compare them to other animals explaining the role within the body. Pupils explore how changes in muscles result in movement and the implications these discoveries have in the scientific development of prosthetic limbs. They study how energy is used by the body, what constitutes a balanced diet in humans and how research contributes to nutritionist expertise.

Outcomes:

- ✓ Recall the three key functions of the skeleton (movement, support and protection).
- ✓ Describe a vertebrate, invertebrate, endoskeleton and exoskeleton and use this information to group animals.
- ✓ Identify and name the skull, spine, ribs and pelvis on a diagram.
- ✓ Recall that muscles cause movements in the body, some of which we can control consciously.
- ✓ Describe that muscles can cause a movement by shortening and pulling on a bone.
- ✓ Recall that animals, including humans, need to eat food to survive.
- ✓ Describe some examples of how energy is used by the body and make comparisons about the energy demands between people.
- ✓ List some of the seven nutrient groups.
- ✓ Name foods that are good sources of nutrient groups and describe what they are needed for in the body.
- ✓ Compare two different meals and explain which is more balanced by naming the nutrient groups and commenting on the relevant proportions.

When working scientifically, pupils who are **secure** will be able to:

- ✓ Record measurements of different bones and use the data to sort them into size order.
- ✓ Describe some ways scientific research has improved the field of bionics/prosthetics, such as the choice of materials or linking their movement to muscles in the arm.
- ✓ Find relevant data on food packaging and make numerical comparisons.

Learning Objective	Learning Outcome
<p>To explain the role of a skeleton.</p> <p>Working scientifically: To group animals based on their physical properties.</p>	<ul style="list-style-type: none"> • I can name the three key functions of the skeleton. • I can recall key features of a vertebrate, invertebrate, endoskeleton and exoskeleton. • I can group animals based on their skeletons. • I can describe the role of joints in the skeleton.
<p>To recognise the main bones in the body.</p> <p>Working scientifically: To measure and sort data.</p>	<ul style="list-style-type: none"> • I can name key bones in the human skeleton. • I can identify the location of key bones in the human skeleton. • I can measure the length of different bones. • I can sort the data into size order.
<p>To explain how muscles are used for movement.</p> <p>Science in action: To explore scientific advances.</p>	<ul style="list-style-type: none"> • I can recall that there are different muscles in the body. • I can describe how a muscle causes movement. • I can explain how scientific research has helped with prosthetics.
<p>To explain how food is an essential energy source for animals.</p> <p>Working scientifically: To gather and compare data to answer questions.</p>	<ul style="list-style-type: none"> • I can recall that animals, including humans, need to eat food to survive. • I can describe ways the body uses energy. • I can identify how energy needs are different between people. • I can compare the nutritional information on food packaging.
<p>To identify the main nutrient groups and their simple functions.</p> <p>Working scientifically: To record information using secondary sources.</p>	<ul style="list-style-type: none"> • I can recall some of the seven nutrient groups. • I can give examples of food that contain a particular nutrient group. • I can explain why a particular nutrient group is essential for the body.
<p>To explain what makes a balanced diet.</p>	<ul style="list-style-type: none"> • I can give examples of foods that make up a balanced diet. • I can compare different meals, explaining which is more balanced.

<p>Science in action: To explore how knowledge has progressed over time and different jobs use this information.</p>	<ul style="list-style-type: none"> • I can describe some changes to scientific knowledge about nutrition. • I can identify some jobs that require knowledge of nutrition.
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Unit 3B: Energy - Light and Shadows

Identifying examples of light sources, children learn that light is needed to see and how its absence causes darkness. Children investigate reflection and shadow formation, including how different factors change the shadows observed. They explore how shadows can be used to entertain in the arts and create shadow puppets to recount how different people work or experiment with light.

Outcomes:

- ✓ Recall examples of light sources, objects that do not give out light and that darkness is the absence of light.
- ✓ Describe ways to protect eyes from harm.
- ✓ Describe what happens when light reflects, give examples of reflective surfaces or materials and describe factors that may affect the quality of a reflected image.
- ✓ Describe how shadows form and identify patterns between groups of materials and the shadows produced.
- ✓ Recall factors that affect the way a shadow appears, including what causes shadows to change throughout the day and factors that change the size of a shadow
- ✓ Describe the pattern of changing shadows throughout the day.
- ✓ Describe how the light source's distance affects the shadow's size.
- ✓ Explain why a particular material is appropriate to make a shadow puppet and use knowledge of shadows to animate it.

When working scientifically, pupils who are **secure** will be able to:

- ✓ Recall what information needs recording to decide the number of columns in a results table and suggest suitable headings for the results table.
- ✓ Record information in the correct columns.
- ✓ Identify if a question is testable, explain why and plan ways to answer a testable question.
- ✓ Identify and explain why something is an advantage or disadvantage of a method and suggest an improvement to the experiment.
- ✓ I can describe patterns in data and quote values as evidence of patterns in data.
- ✓ I can identify odd results that do not fit the pattern.
- ✓ I can use patterns to make predictions for missing data.

Learning Objective	Learning Outcome
<p>Knowledge To explain the role of light sources.</p> <p>Working scientifically To plan and draw a results table.</p>	<ul style="list-style-type: none"> • I can recall examples of light sources and those that do not give out light. • I can describe ways to protect my eyes from harm. • I can recall that darkness is the absence of light. <p>Working scientifically</p> <ul style="list-style-type: none"> • I can recall what information needs recording to decide the number of columns.

	<ul style="list-style-type: none"> • I can suggest suitable headings for the results table. • I can record information in the correct columns.
To compare light reflecting on different surfaces.	Knowledge <ul style="list-style-type: none"> • I can describe what happens when light reflects. • I can give examples of reflective surfaces or materials. • I can describe factors that may affect the quality of a reflected image.
Knowledge To recognise which materials cast a shadow. Working scientifically To ask testable questions and plan how to answer them.	<ul style="list-style-type: none"> • I can describe how shadows form. • I can identify patterns between groups of materials and the shadows produced. • I can recall factors that affect the way a shadow appears. Working scientifically <ul style="list-style-type: none"> • I can identify if a question is testable. • I can explain whether a question is testable or not. • I can plan ways to answer a testable question.
Knowledge To summarise how shadows change throughout the day. Working scientifically To evaluate a method.	Knowledge <ul style="list-style-type: none"> • I can recall what causes shadows to change throughout the day. • I can describe the pattern of changing shadows throughout the day. Working scientifically <ul style="list-style-type: none"> • I can identify something as an advantage or disadvantage of a method. • I can explain why something is an advantage or disadvantage of a method. • I can suggest an improvement to the experiment.
Knowledge To investigate how the distance of the light source affects the size of its shadow. Working scientifically To find patterns in data and form conclusions.	Knowledge <ul style="list-style-type: none"> • I can name factors that change the size of a shadow. • I can describe how the light source's distance affects the shadow's size. Working scientifically <ul style="list-style-type: none"> • I can describe patterns in data. • I can quote values as evidence of patterns in data. • I can identify odd results that do not fit the pattern. • I can use patterns to make predictions for missing data.
Knowledge To tell a story using shadow puppets. Science in action	Knowledge <ul style="list-style-type: none"> • I can explain why a particular material is appropriate to make a shadow puppet. • I can use my knowledge of shadows to animate a shadow puppet. Science in action

To recall how different people work with light and shadows.	<ul style="list-style-type: none"> • I can name different examples of people who work with light and shadows. • I can describe how different people work with light and shadows.
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Unit 4B: Forces, Earth and Space - Forces and Magnets

Identifying examples of light sources, children learn that light is needed to see and how its absence causes darkness. Children investigate reflection and shadow formation, including how different factors change the shadows observed. They explore how shadows can be used to entertain in the arts and create shadow puppets to recount how different people work or experiment with light.

Outcomes:

- ✓ Identify examples of pushes, pulls and twists.
- ✓ Define a force including describing, naming and classifying contact and non-contact forces.
- ✓ Describe the relationship between friction and the roughness of a surface.
- ✓ Identify examples of friction being useful or not.
- ✓ Predict attraction and repulsion between like and opposite poles.
- ✓ Identify examples of magnetic and non-magnetic materials.
- ✓ Name some examples of types of magnets and compare their strengths.
- ✓ Describe some examples of the uses of magnets.

When working scientifically, pupils who are **secure** will be able to:

- ✓ Use arrows and scientific vocabulary to show the direction of a contact force.
- ✓ Use evidence to support conclusions.
- ✓ Identify the variables to change, measure and control.
- ✓ Write a method to explain how to use a magnet to sort and classify materials as magnetic or non-magnetic.
- ✓ Label the axes of a bar chart.
- ✓ Draw bars on a chart accurately.
- ✓ Identify key information from a source.
- ✓ Use more than one source to research a question.

Learning Objective	Learning Outcome
<p>To describe the effects of contact forces.</p> <p>Working scientifically: To label a diagram using arrows and scientific vocabulary.</p>	<ul style="list-style-type: none"> • I can define the terms 'force' and 'contact force'. • I can classify a force as a push, pull or a twist. • Working scientifically: I can use arrows and scientific vocabulary to show the direction of a contact force.

<p>To recognise the effects and uses of forces.</p> <p>Working scientifically: To write a scientific conclusion identifying cause and effect.</p>	<ul style="list-style-type: none"> • I can list the effects of forces. • I can define the term 'friction'. • I can list some uses of friction. • I can describe how surface roughness affects friction. • Working scientifically: I can use evidence to support my conclusion.
<p>To interpret how and why things move differently on different surfaces.</p> <p>Working scientifically: To plan an investigation using variables.</p>	<ul style="list-style-type: none"> • I can describe and compare how things move on rough and smooth surfaces. • I can explain why things move differently on rough and smooth surfaces. • Working scientifically: I can identify the variables to change, measure and control.
<p>To describe the effects of magnets.</p> <p>Working scientifically: To write a method.</p>	<ul style="list-style-type: none"> • I can define the terms 'magnetism', 'magnetic material' and 'non-magnetic material'. • I can describe the poles of a magnet and how they attract and repel. • I can name some magnetic metals. • Working scientifically: I can write a method to explain how to use a magnet to classify materials as magnetic or non-magnetic.
<p>To compare the properties of different types of magnets.</p> <p>Working scientifically: To display data using a bar chart.</p>	<ul style="list-style-type: none"> • I can predict whether two magnets will attract or repel. • I can name some examples of magnets. • I can compare the strength of different magnets. • Working scientifically: I can label the axes of a bar chart. • Working scientifically: I can draw the bars accurately.
<p>To explain the uses of magnets.</p> <p>Working scientifically: To research the uses of magnets.</p>	<ul style="list-style-type: none"> • I can list some of the uses of magnets. • I can describe some of the uses of magnets. • Working scientifically: I can identify key information from a source. • Working scientifically: I can use more than one source to research.

Unit 5B: Materials - States of Matter

Investigating the properties of solids, liquids and gases, children learn about the different states of matter. They explore changes of state using relatable examples and use this to explain changes to water through the water cycle. Pupils investigate the relationship between temperature and rate of evaporation while broadening their experience of working scientifically.

Outcomes:

Pupils who are **secure** will be able to:

- ✓ Identify solids, liquids and gases using their properties.
- ✓ Describe melting, freezing, condensing and evaporating.
- ✓ Describe the different stages of the water cycle.
- ✓ Describe how temperature affects the rate of evaporation and therefore the water cycle.

When working scientifically, pupils who are **secure** will be able to:

- ✓ Ask relevant questions.
- ✓ Use results to draw simple conclusions.
- ✓ Use thermometers to take accurate measurements.
- ✓ Make predictions for new values.
- ✓ Record findings using labelled diagrams.
- ✓ Research using more than one source.

Learning Objective	Learning Outcome
<p>Knowledge To identify solids using their properties.</p> <p>Working scientifically To ask relevant questions about the properties of solids.</p>	<p>Knowledge</p> <ul style="list-style-type: none"> • I can list the properties of solids. • I can identify examples of solids. <p>Working scientifically</p> <ul style="list-style-type: none"> • I can ask questions about the properties of solids. • I can identify which questions are relevant. • I can identify which properties to test.
<p>Knowledge To identify liquids and gases using their properties.</p> <p>Working scientifically To use results to draw simple conclusions about the properties of liquids.</p>	<p>Knowledge</p> <ul style="list-style-type: none"> • I can list the properties of liquids and gases. • I can identify examples of liquids and gases. <p>Working scientifically</p> <ul style="list-style-type: none"> • I can make careful observations. • I can use these observations to draw simple conclusions.
<p>Knowledge To describe melting and freezing.</p> <p>Working scientifically To use thermometers to take accurate measurements before and after melting.</p>	<p>Knowledge</p> <ul style="list-style-type: none"> • I can describe the conditions needed for melting and freezing. • I can describe the property changes as a material melts or freezes. • I can name the start and end states when melting and freezing materials. <p>Working scientifically</p> <ul style="list-style-type: none"> • I can use a thermometer accurately. • I can read a thermometer accurately.
<p>Knowledge To describe condensing and evaporating.</p> <p>Working scientifically</p>	<p>Knowledge</p> <ul style="list-style-type: none"> • I can describe the conditions needed for melting and freezing. • I can describe the property changes as a material melts or freezes.

<p>To make predictions for new values about evaporation rates.</p>	<ul style="list-style-type: none"> I can name the start and end states when melting and freezing materials. <p>Working scientifically</p> <ul style="list-style-type: none"> I can predict how temperature will affect evaporation rates. I can predict how wind will affect evaporation rates.
<p>Knowledge To describe the different stages of the water cycle.</p> <p>Working scientifically To record the stages of the water cycle using a labelled diagram.</p>	<p>Knowledge</p> <ul style="list-style-type: none"> I can name the stages of the water cycle. I can order the stages of the water cycle. I can describe the changes of state that occur during the water cycle. <p>Working scientifically</p> <ul style="list-style-type: none"> I can draw a diagram using key information. I can label a diagram with keywords
<p>Knowledge To describe how temperature affects evaporation rates and the water cycle.</p> <p>Working scientifically To research climate change and the water cycle.</p>	<p>Knowledge</p> <ul style="list-style-type: none"> I can describe the effect of climate change on temperature. I can link temperature change to evaporation rates. I can describe how climate change affects the water cycle. <p>Working scientifically</p> <ul style="list-style-type: none"> I can identify key information from a source. I can use more than one source to research.

Unit 6B: Making Connections - TBC

Outcomes:

Learning Objective	Learning Outcome
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Upper Key Stage 2

Year A

Unit 1A:

Outcomes:



Learning Objective	Learning Outcome
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Unit 1B:

Outcomes:

Learning Objective	Learning Outcome
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Unit 1C:

Outcomes:

Leaning Objectives	Learning Outcomes
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Year B

Unit 2A:

Outcomes:

Leaning Objectives	Learning Outcomes
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Unit 2B:

Outcomes:

Learning Objectives	Learning Outcomes
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Unit 2C:

Outcomes:

Learning Objectives	Learning Outcomes
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