Science Progression Map
Cycle B

"Somewhere something incredible is waiting to be known."

Carl Sagan

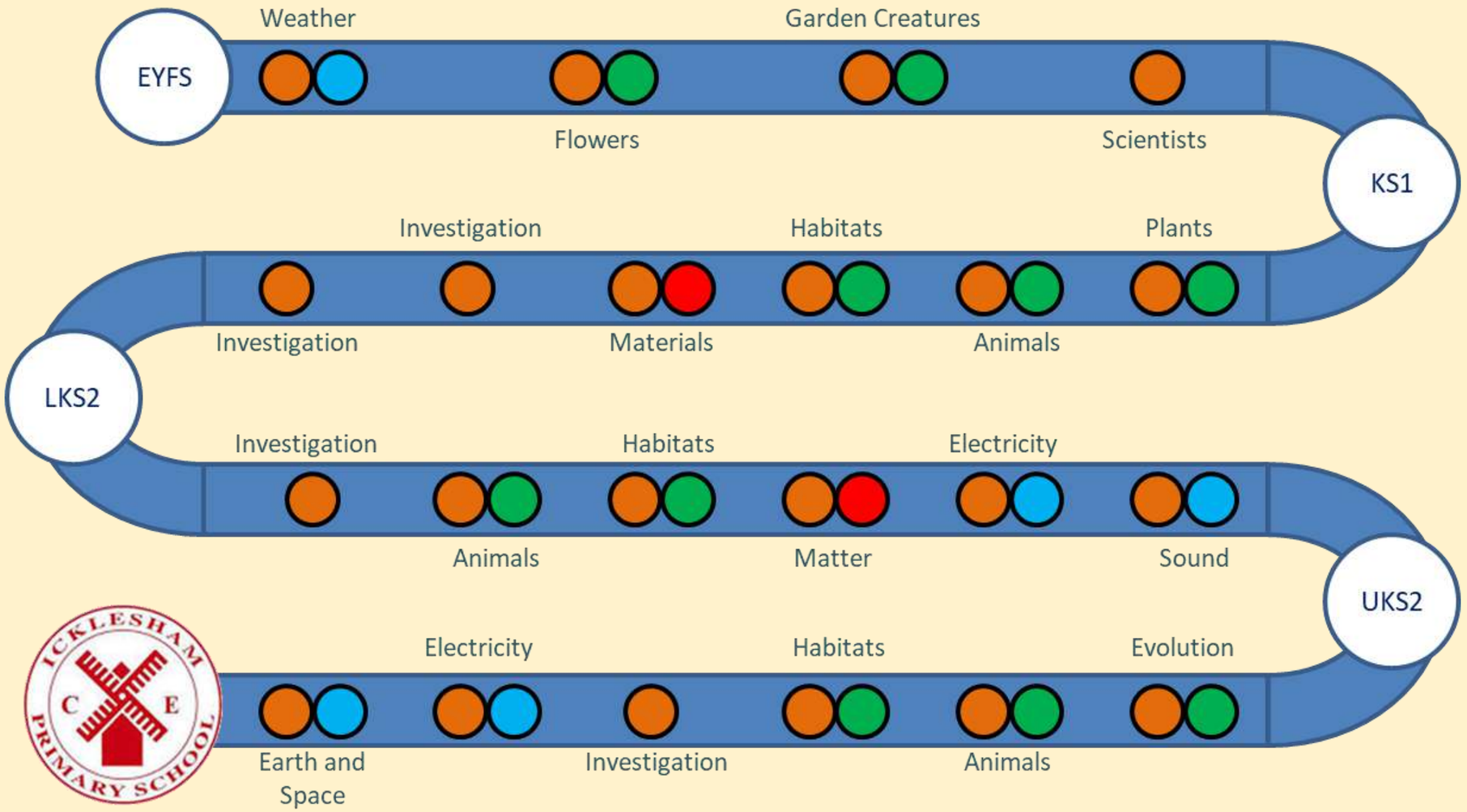
Science Curriculum Map
Cycle B

Working Scientifically

Biology

Chemistry

Physics



Cycle B - EYFS – Unit 1: weather and seasons (ongoing)

Objective
To compare different weathers and seasons.

I wonder…
What is the weather?

Substantive Knowledge (Content)

- To know that there are different kinds of weather
- To know that weather changes across the year
- To know that the weather has an impact on the things we do
- To know that weather has an impact on the world around them
- To know that there are different types of cloud
- To know that rain comes from water droplets in clouds
- To know that rain is important for living things
- To know that there are four seasons: autumn, winter, spring, summer
- To know that summer is when it is most warm and winter is when it is most cold
- To know that sunshine brings warmth
- To know that when it is very cold, water can freeze and become ice, frost, hail and snow
- To know that wind is caused by air around them moving

Future Learning

KS1
Children will be looking at seasonal changes including weather and day length differences.

LKS2
Children will be learning about rocks and soil and seeing how these are formed over time.

Skills

Recognise	Name and point out who or what something is
Identify	Distinguish something or someone from others that may be similar
Describe	'Say what you see'. Give an account in words of something or someone
Observe	Identify and distinguish with a degree of analysis some things that may potentially be more noteworthy or important than others
Compare and contrast	Find similarities and differences
Recall	Remember and recount something learned

Concepts

Similarity and difference	Making comparisons, finding patterns, noting differences and drawing conclusions
Cause and consequence	models and laws, reactions between materials, observing processes
Process	The natural or human events and actions that maintain equilibrium or cause change.
Environment	The surroundings of a place in which a person, animal or plant lives and interacts.

Key vocabulary

air	The mixture of gasses that surrounds the earth and that we breathe
calm / still	Absence of wind
cloud	White mass in sky made of water droplets
droplet	A small drop of liquid
freeze / freezing / frozen	Temperature lower than 0℃, cold and often hard
frost / frosty	Thin, white layer of ice
hot/cold/warm/cool	*temperatures*
ice / icy / icicle	Water that has frozen and become solid
light / dark	Brightness that allows things to be seen / absence of
melt /melting	Turn from solid to liquid
morning / afternoon / evening / night /day	Times of day
plant / flower / grass	Living things growing in earth
puddle	Small pool of liquid on the ground from rain
rain	Drops of water from clouds
season - Autumn, Winter, Spring, Summer	One of the four periods of the year
shade / shadow	Slight darkness caused by blockage of light from sun
sky	The area above the earth in which clouds etc. can be seen
snow	Small, soft, white pieces of ice that fall from the sky
storm	Extreme weather condition
sun / sunny / sunshine	the star that gives light and heat to Earth
temperature	The measured amount of heat in a place
today / yesterday	The present day / the day before
water	Clear liquid necessary for plant and animal life
waterproof	Not allowing water to go through
weather	The conditions in the air above the earth.
wet / dry	Covered / not covered in water or other liquid
wind / breeze	Natural current of air strong enough to be felt

Assessment points

- **Recognise** features of different kinds of weather
- **Identify** different kinds of weather
- **Identify** seasons
- **Describe** the effect of weather on the environment and on the things we do
- **Observe** and record the weather
- **Observe** seasonal changes in their immediate environment
- **Compare and contrast** the weather at different times of the year
- **Recall** the names of the four seasons

EYFS coverage

- Explore the natural world around them, making observations and drawing pictures. *The Natural World ELG*
- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class *The Natural World ELG*
- Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. *The Natural World ELG*

Minimum expectations, including for pupils with SEND

- **Recognise** features of different kinds of weather
- **Identify** different kinds of weather
- **Describe** the effect of weather on the environment and on the things we do

High prior attainment and extension opportunities, including for pupils with SEND
Look at examples of extreme weather and how it can damage the environment.

Cycle B - EYFS – Unit 2: Flowers and Plants

Objective
To know about features of flowers and how they grow

I wonder…
Why do people like to give and receive flowers?

Substantive Knowledge (Content)

- To know that flowering plants grow from bulbs and / or seeds
- To know that plants need soil, sunlight and water to grow
- To know that flowers have a stem, leaves and petals
- To know the names of some flowering plants
- To know that flowering plants look different at different times of year

Future Learning

KS1
Children will be naming a variety of plants and their parts.

LKS2
Children will be learning about the functions of the different parts of a plant and how water is transported.

Skills

Recognise	Name and point out who or what something is
Identify	Distinguish something or someone from others that may be similar
Describe	'Say what you see'. Give an account in words of something or someone
Observe	Identify and distinguish with a degree of analysis some things that may potentially be more noteworthy or important than others
Compare and contrast	Find similarities and differences
Recall	Remember and recount something learned

Concepts

Similarity and difference	Making comparisons, finding patterns, noting differences and drawing conclusions
Cause and consequence	models and laws, reactions between materials, observing processes
Process	The natural or human events and actions that maintain equilibrium or cause change.
Environment	The surroundings of a place in which a person, animal or plant lives and interacts.

Key vocabulary

plant	To put a plant into the ground so that it will grow.
bulb	A round root from which some plants grow
sow	To put seeds in soil so they will grow
seed	The small, hard part of a plant from which a new plant grows.
trowel	Small tool used for digging in the garden
watering can	Container for water with a handle and long tube, used for pouring water onto garden plants
stem	The thin, upright part of the plant on which the flowers and leaves grow.
petal	The colourful, or white parts of the flower.
leaf, leaves	The part of the plants that is flat, thin and usually green, but may change colour in Autumn.
soil	The substance on the surface of the earth in which plants grow.
seedling	A young plant that has been grown from seed
sunlight	Light that comes from the sun
water	Clear liquid necessary for plant and animal life
sweet pea	Sweet scented climbing flowering plant
cosmos	Large daisy-shaped flower, often pink or white
cornflower	Plant with flowers that are often blue
calendula	Plant with orange or yellow daisy-shaped flowers
poppy	Plant with a large, delicate flower
lavender	Plant with sweet-smelling purple flowers

Assessment points

- **Recognise** different flowers
- **Identify** different flowers
- **Describe** different flowers – their features, colours, shape etc
- **Observe** the changes in plants as they grow from seed to seedling to full flowering plant
- **Compare and contrast** the Giving Garden at different times of the year
- **Compare and contrast** different flowers
- **Recall** the things that are necessary for plants to grow
- **Recall** the names of some flowers

EYFS coverage

- Explore the natural world around them, making observations and drawing pictures. *The Natural World ELG*
- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class *The Natural World ELG*
- Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. *The Natural World ELG*

Minimum expectations, including for pupils with SEND

- **Recognise** different flowers
- **Identify** different flowers
- **Describe** different flowers – their features, colours, shape etc

High prior attainment and extension opportunities, including for pupils with SEND
Investigate the different seeds and seed pods for different flowers – poppy, sweet pea, calendula. Observe the change from flower with petals to seed / seed pods and discuss how seeds then self-sow to grow more flowers.

Cycle B - EYFS – Unit 3: Garden Creatures

Objective
To know about invertebrates

I wonder…
What creatures can we find in the garden?

Substantive Knowledge (Content)

- To know that invertebrates are small animals that do not have a spine or a skeleton inside their body.
- To know that some have a hard shell (exoskeleton) outside their body (insects, spiders)
- To know that some have soft bodies (e.g. worms, slugs)
- To know that invertebrates have different numbers of legs and wings. Some have antennae.
- To know that invertebrates need shelter, food, water and air to survive.
- To know that some invertebrates go through a process of metamorphosis (caterpillars)

Future Learning

KS1
The children will be learning about different animal types.

LKS2
Children will be learning about why some animals have skeletons and how they survive.

UKS2
Children will learn about how humans change as they get older.

Skills

Recognise	Name and point out who or what something is
Identify	Distinguish something or someone from others that may be similar
Describe	'Say what you see'. Give an account in words of something or someone
Observe	Identify and distinguish with a degree of analysis some things that may potentially be more noteworthy or important than others
Classify	To divide things into groups according to their type
Compare and contrast	Find similarities and differences
Recall	Remember and recount something learned

Concepts

Similarity and difference	Making comparisons, finding patterns, noting differences and drawing conclusions
Process	The natural or human events and actions that maintain equilibrium or cause change.
Organization / structure and function	The way in which the parts of a system are arranged and their purposes

Key vocabulary

invertebrate	An animal with no spine
spine	The line of bones down the centre of the back that provides support for the body
skeleton	The frame of bones supporting a human or animal body
shell	A hard-outer covering
legs	Part of the human / animal body used for standing and walking
wings	The flat part of the body that an insect uses for flying
antennae	A pair of long, thin organs found on the head of some invertebrates, used to feel with
metamorphosis	The process by which the young form develops into the adult form
caterpillar	A small long invertebrate with many legs
chrysalis	A butterfly at the stage of development when it is covered by a hard case
cocoon	The silk casing that a moth caterpillar spins around itself before it transforms into a moth
butterfly	Insect with large, often brightly coloured and patterned wings
moth	Insect with wings similar to a butterfly
spider	Invertebrate with eight thin legs that catches insects in a web
ladybird	Small, red beetle that is round and has black spots
bee	Yellow and black flying insect that can sting
ant	Very small insect that lives under the ground
worm	invertebrate with long, narrow, soft body without legs or wings
snail	Invertebrate with a soft, wet body and a round shell that moves very slowly
slug	Invertebrate with a soft, wet body and no shell

Assessment points

- **Recognise** different invertebrates
- **Identify** different invertebrates
- **Describe** different invertebrates – their features, colours, shape etc
- **Observe** the process of metamorphosis from caterpillar to butterfly
- **Classify** invertebrates by features
- **Compare and contrast** different invertebrates
- **Recall** the names and features of some invertebrates

EYFS Coverage

- Explore the natural world around them, making observations and drawing pictures. *The Natural World ELG*
- Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. *The Natural World ELG*

Minimum expectations, including for pupils with SEND

- **Recognise** different invertebrates
- **Identify** different invertebrates
- **Describe** different invertebrates – their features, colours, shape etc
- **Observe** the process of metamorphosis from caterpillar to butterfly

High prior attainment and extension opportunities, including for pupils with SEND
Choose an invertebrate to research in more detail.

Cycle B - EYFS – Unit 4: What do scientists do?

Objective
To know about the discipline of Science

I wonder…
What do scientists do?

Substantive Knowledge (Content)

- To know that scientists ask questions, conduct experiments, record observations, find things out, make predictions about what they think will happen, then test to see if they were right and what they can learn.
- To know that there are lots of different kinds of scientists.
- To know that some famous scientists include Stephen Hawking and Jane Goodall.
- To know that some people in our school community (e.g. parents) are scientists.
- To know that matter can change in different ways – melting, freezing, solidifying, drying, evaporating…

Future Learning

KS1
Children will be learning how to conduct a simple comparative test.

LKS2
Children will be learning how to conduct a fair test investigation.

UKS2
Children will be using scientific evidence to support or refute arguments.

Skills

Predict	To say what you think will happen
Observe	Identify and distinguish with a degree of analysis some things that may potentially be more noteworthy or important than others
Recall	Remember and recount something learned
Reason / speculate	Try to understand and make judgments based on facts / to guess possible answers

Concepts

Similarity and difference	Making comparisons, finding patterns, noting differences and drawing conclusions
Process	The natural or human events and actions that maintain equilibrium or cause change.
Cause and consequence	models and laws, reactions between materials, observing processes

Key vocabulary

scientist	An expert who works in science
experiment	A test done in order to learn something
observe	To watch carefully
predict	To say what you think will happen
melt	To change from solid to liquid due to heating
freeze	To change from liquid to solid due to cold
evaporate	To change from liquid to gas, especially due to heating
solid	A substance that is hard or firm, keeping a clear shape
liquid	A substance that can be poured easily
gas	A substance in a form like air that is neither solid nor liquid

Assessment points

- **Predict** what might happen as a result of a process
- **Observe** changes in matter as a result of different processes
- **Recall** the names of some famous scientists
- **Reason / speculate** as to why different changes occur

EYFS Coverage

- Explore the natural world around them, making observations and drawing pictures. *The Natural World ELG*
- Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. *The Natural World ELG*

Minimum expectations, including for pupils with SEND

- **Observe** changes in matter as a result of different processes

High prior attainment and extension opportunities, including for pupils with SEND
Children to record their observations and experiments through drawing and writing.

Cycle B - Science – KS1 – Unit 1: Plants

Objective
To know about how plants grow

I wonder…
What do farmers need to make bread?

Substantive Knowledge (Content)

- To know that seeds grow into plants
- To know that bulbs are parts of plants that let the plant rest underground over the winter when it is too cold, then grow back later in the year when conditions are right
- To know that seeds are dispersed by bursting, being shaken, using the wind or water, cracking and rolling or being spread by animals by getting stuck on fur/skin or after being eaten
- To know that seeds need air, water, the right temperature, good soil conditions, and the right amount of light to germinate
- To know that seeds need water, light, suitable temperature, air and time to grow
- To be able to describe how plants change over time

Prior Learning

EYFS
Children have learnt what plants need to grow.

Future Learning

LKS2
Children will be learning about the functions of the different parts of a plant and how water is transported.

Skills

Ask and answer questions	Answering questions using data or information that they have not collected firsthand
Identify and classify	Identifying and naming materials/living things and organise them into groups
Observe	Observing or measuring how one variable changes over time
Data recording	Documenting facts and observations
Pattern spotting	Looking for relationships between two sets of data

Concepts

Responsibility	Working safely, how science can solve problems, climate change and sustainability
Similarity and difference	Making comparisons, finding patterns, noting differences and drawing conclusions
Cause and consequence	models and laws, reactions between materials, observing processes
Continuity and change	observing what changes and what stays the same
Significance	significant scientists, discoveries, laws, models and theories
Communication	Using scientific vocabulary, drawing, explaining, evaluating and interpreting data
Enquiry	Working scientifically, observing, classifying, patterns, fair testing, using evidence

Key vocabulary

disperse	When seeds move away from the parent plant.
germination	When the conditions are right, the seed soaks up water and swells, and the tiny new plant bursts out of its shell.
sunlight	Light that comes from the sun.
temperature	How warm or cold something is.
water	A liquid needed to helps plants grow.
seed	
shoot	

Assessment points

- **Recognise** seeds and bulbs
- **Identify** some differences between bulbs and seeds
- **Perform** a simple test involving seeds
- **Observe** how seeds and plants change over time
- **Recall** what disperse means
- **Record** how plants change over time
- **Describe** how seeds and bulbs change over time
- **Compare** the growth of seeds under various conditions
- **Explain** the best time to plant seeds and bulbs

National Curriculum Coverage

- Observe and describe how seeds and bulbs grow into mature plants
- Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy

Minimum expectations, including for pupils with SEND
Children to identify differences between seeds grown in different conditions. With support, can explain how plants grow.

High prior attainment and extension opportunities, including for pupils with SEND
Children to think about, discuss and reason when is the best time to plant seeds and bulbs.

Cycle B - Science – KS1 – Unit 2: Animals

Objective
To know how animals grow and survive

I wonder…
What is a cygnet?

Substantive Knowledge (Content)

- To know that offspring are an animals young
- To know how animals reproduce
- To know how animals grow
- To know that animals need food, water, protection from weather and predators and a place to raise their young to survive
- To describe how habitats help animals to survive
- To describe what a healthy balanced diet is
- To describe why exercise is important

Prior Learning

EYFS
Children have identified creatures that can be found in the garden.

Future Learning

LKS2
Children will be learning about the main body parts associated with the digestive system.

UKS2
Children will be learning about the main parts and functions of the human circulatory system.

Skills

Ask and answer questions	Answering questions using data or information that they have not collected firsthand
Identify and classify	Identifying and naming materials/living things and organise them into groups
Observe	Observing or measuring how one variable changes over time
Data recording	Documenting facts and observations
Pattern spotting	Looking for relationships between two sets of data

Concepts

Responsibility	Working safely, how science can solve problems, climate change and sustainability
Similarity and difference	Making comparisons, finding patterns, noting differences and drawing conclusions
Cause and consequence	models and laws, reactions between materials, observing processes
Continuity and change	observing what changes and what stays the same
Significance	significant scientists, discoveries, laws, models and theories
Communication	Using scientific vocabulary, drawing, explaining, evaluating and interpreting data
Enquiry	Working scientifically, observing, classifying, patterns, fair testing, using evidence

Key vocabulary

adult	A fully-grown animal or plant
young	Offspring that has not reached adulthood
life cycle	The changes living things go through to become an adult
offspring	The child of an animal
survival	Staying alive
air	
develop	
diet	
exercise	
food	
water	

Assessment points

- **Recognise** offspring and their adults
- **Identify** some things animals need to survive
- **Record** a life cycle for an animal
- **Describe** how animals change in a life cycle
- **Compare** different types of food
- **Explain** why exercise is important

National Curriculum Coverage

- Notice that animals, including humans, have offspring which grow into adults
- Find out about and describe the basic needs of animals, including humans, for survival (water, food and air)
- Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

Minimum expectations, including for pupils with SEND
Children to understand what a life cycle is. With support, can explain what animals need to help them grow and survive.

High prior attainment and extension opportunities, including for pupils with SEND
Children to think about, discuss and reason why humans shouldn't eat too much unhealthy food.

Objective
To identify and name habitats and their properties

I wonder…
Why do many snakes live in grass?

Substantive Knowledge (Content)

- To know which things are living, dead and have never been alive
- To know why living things need suitable habitats
- To be able to describe different habitats
- To know that a micro-habitat is a small area which differs somehow from the surrounding habitat
- To know that a food chain is a sequence of events in an ecosystem, where one organism eats another. It begins with a primary source like the sun which is followed on by consumers and predators
- To be able to describe why food chains are important

Prior Learning

EYFS
Children have learnt where many common animals live.

Future Learning

LKS2
Children will be learning that habitats can change throughout the year.

UKS2
Children will be classifying living things based on specific characteristics.

Skills

Ask and answer questions	Answering questions using data or information that they have not collected firsthand
Identify and classify	Identifying and naming materials/living things and organise them into groups
Observe	Observing or measuring how one variable changes over time
Data recording	Documenting facts and observations
Pattern spotting	Looking for relationships between two sets of data

Concepts

Responsibility	Working safely, how science can solve problems, climate change and sustainability
Similarity and difference	Making comparisons, finding patterns, noting differences and drawing conclusions
Cause and consequence	models and laws, reactions between materials, observing processes
Continuity and change	observing what changes and what stays the same
Significance	significant scientists, discoveries, laws, models and theories
Communication	Using scientific vocabulary, drawing, explaining, evaluating and interpreting data
Enquiry	Working scientifically, observing, classifying, patterns, fair testing, using evidence

Key vocabulary

habitat	The place where something lives
micro-habitat	A very small habitat, such as under a rock
food chain	A sequence of different things that eat each other
desert	A type of habitat
rainforest	A type of habitat
Arctic	
coastal	
dead	
food source	
Living	
never living	
ocean	
urban	
woodland	

Assessment points

- **Recognise** different habitats
- **Identify** animals that live in habitats
- **Observe** how habitats differ
- **Recall** what a food chain is
- **Record** a food chain
- **Describe** why living things need suitable habitats
- **Compare** things that are alive, dead and have never been alive
- **Explain** what a habitat is

National Curriculum Coverage

- Explore and compare the differences between things that are living, dead, and things that have never been alive
- Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other
- Identify and name a variety of plants and animals in their habitats, including microhabitats
- 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.

Minimum expectations, including for pupils with SEND
Children to name some different habitats. With support, children can explain what a habitat is.

High prior attainment and extension opportunities, including for pupils with SEND
Children to think about, discuss and reason what would happen if a species of animal left a habitat.

Objective
To identify and compare the suitability of materials

I wonder…
Where is the best place to keep a muddy bike?

Substantive Knowledge (Content)

- To know that metal, plastic, wood, glass, ceramics, synthetic fibres and composite are different types of material
- To know that materials can be sorted according to their properties i.e. magnetic, waterproof, transparent
- To be able to sort which materials are man-made and which are natural
- To know that different ways materials can change shape in different ways through heating, bending, stretching
- To be able to describe why some materials are more suitable than others
- To be able to describe different products can be made from materials

Prior Learning

EYFS
Children have explored different materials through play.

Future Learning

LKS2
Children will be learning that some materials change state when they are heated or cooled.

UKS2
Children will be learning about the different states of matter.

Skills

Ask and answer questions	Answering questions using data or information that they have not collected firsthand
Identify and classify	Identifying and naming materials/living things and organise them into groups
Observe	Observing or measuring how one variable changes over time
Data recording	Documenting facts and observations
Pattern spotting	Looking for relationships between two sets of data

Concepts

Responsibility	Working safely, how science can solve problems, climate change and sustainability
Similarity and difference	Making comparisons, finding patterns, noting differences and drawing conclusions
Cause and consequence	models and laws, reactions between materials, observing processes
Continuity and change	observing what changes and what stays the same
Significance	significant scientists, discoveries, laws, models and theories
Communication	Using scientific vocabulary, drawing, explaining, evaluating and interpreting data
Enquiry	Working scientifically, observing, classifying, patterns, fair testing, using evidence

Key vocabulary

man-made material	A material made by people such as glass
natural material	A material made by nature such as wood
properties	What a material is like and how it behaves
durable	Strong and lasts a long time
suitability	Having the properties that are right for a specific purpose
bend	
cardboard	
fabric	
glass	
material	
metal	
paper	
plastic	
rubber	
squash	
stretch	
twist	
wood	

Assessment points

- **Recognise** different materials
- **Identify** the materials used to make products
- **Record** a list of materials used to make specific products
- **Classify** things based on their materials
- **Observe** how materials can change shape
- **Recall** some of the properties of materials
- **Describe** what suitability means
- **Compare** the suitability of materials
- **Explain** why some materials are better than others for making products

National Curriculum Coverage

- Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses
- Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

Minimum expectations, including for pupils with SEND
Children to identify some of the materials used to make an object. With support, can say some of the ways materials can change shape.

High prior attainment and extension opportunities, including for pupils with SEND
Children to think about, discuss and reason what the most durable material is and what it could be used for.

Cycle B - Science – KS1 – Unit 5: Comparative Test

Objective
To conduct an investigation

I wonder…
How quick are my reactions?

Substantive Knowledge (Content)

- To know that a question is a type of sentence that we ask or write to gain further information from a person or people about something
- To know that a comparative test is a test where pupils compare one event with another and identify different outcomes
- To be able to conduct a comparative test
- To be able to make observations using simple equipment
- To be able to record data
- To know that data recording is important to be able to answer the question in a scientific way
- To be able to identify and classify things
- To be able to spot patterns

Prior Learning

EYFS
Children have learnt what scientists do.

Future Learning

LKS2
Children will be learning how to conduct a fair test investigation.

UKS2
Children will be using scientific evidence to support or refute arguments.

Skills

Ask and answer questions	Answering questions using data or information that they have not collected firsthand
Identify and classify	Identifying and naming materials/living things and organise them into groups
Observe	Observing or measuring how one variable changes over time
Data recording	Documenting facts and observations
Pattern spotting	Looking for relationships between two sets of data

Concepts

Responsibility	Working safely, how science can solve problems, climate change and sustainability
Similarity and difference	Making comparisons, finding patterns, noting differences and drawing conclusions
Cause and consequence	models and laws, reactions between materials, observing processes
Continuity and change	observing what changes and what stays the same
Significance	significant scientists, discoveries, laws, models and theories
Communication	Using scientific vocabulary, drawing, explaining, evaluating and interpreting data
Enquiry	Working scientifically, observing, classifying, patterns, fair testing, using evidence

Key vocabulary

classify	Put things into groups
comparative test	A test to compare things
identify	Knowing what something is
observe	Looking closely at something
record	A way of remembering what happened
experiment	
scientist	
test	

Assessment points

- **Use** equipment to perform a simple test
- **Perform** a simple test
- **Observe** what happens during and after a test
- **Record** what happened during a simple test
- **Answer question** about what they have learned
- **Ask questions** about what they could find out next
- **Predict** what might happen in a simple test with reasoning

National Curriculum Coverage

- Asking simple questions and recognising that they can be answered in different ways
- Observing closely, using simple equipment
- Performing simple tests
- Identifying and classifying
- Using their observations and ideas to suggest answers to questions
- Gathering and recording data to help in answering questions.

Minimum expectations, including for pupils with SEND
Children will use equipment designed to help perform a simple test. With support, can perform a simple test and explain what happened.

High prior attainment and extension opportunities, including for pupils with SEND
Children to think about and discuss some ideas for other simple experiments, including how to plan and conduct it.

Cycle B - Science – KS1 – Unit 6: Working Scientifically

Objective
To conduct an investigation

I wonder…
What is the quickest way to melt ice?

Substantive Knowledge (Content)

- To know that a question is a type of sentence that we ask or write to gain further information from a person or people about something
- To know that a comparative test is a test where pupils compare one event with another and identify different outcomes
- To be able to conduct a comparative test
- To be able to make observations using simple equipment
- To be able to record data
- To know that data recording is important to be able to answer the question in a scientific way
- To be able to identify and classify things
- To be able to spot patterns

Prior Learning

EYFS
Children have learnt what scientists do.

Future Learning

LKS2
Children will be learning how to conduct a fair test investigation.

UKS2
Children will be using scientific evidence to support or refute arguments.

Skills

Ask and answer questions	Answering questions using data or information that they have not collected firsthand
Identify and classify	Identifying and naming materials/living things and organise them into groups
Observe	Observing or measuring how one variable changes over time
Data recording	Documenting facts and observations
Pattern spotting	Looking for relationships between two sets of data

Concepts

Responsibility	Working safely, how science can solve problems, climate change and sustainability
Similarity and difference	Making comparisons, finding patterns, noting differences and drawing conclusions
Cause and consequence	models and laws, reactions between materials, observing processes
Continuity and change	observing what changes and what stays the same
Significance	significant scientists, discoveries, laws, models and theories
Communication	Using scientific vocabulary, drawing, explaining, evaluating and interpreting data
Enquiry	Working scientifically, observing, classifying, patterns, fair testing, using evidence

Key vocabulary

classify	Put things into groups
comparative test	A test to compare things
identify	Knowing what something is
observe	Looking closely at something
record	A way of remembering what happened
experiment	
scientist	
test	

Assessment points

- **Use** equipment to perform a simple test
- **Perform** a simple test
- **Observe** what happens during and after a test
- **Record** what happened during a simple test
- **Answer question** about what they have learned
- **Ask questions** about what they could find out next
- **Predict** what might happen in a simple test with reasoning

National Curriculum Coverage

- Asking simple questions and recognising that they can be answered in different ways
- Observing closely, using simple equipment
- Performing simple tests
- Identifying and classifying
- Using their observations and ideas to suggest answers to questions
- Gathering and recording data to help in answering questions.

Minimum expectations, including for pupils with SEND
Children will use equipment designed to help perform a simple test. With support, can perform a simple test and explain what happened.

High prior attainment and extension opportunities, including for pupils with SEND
Children to think about and discuss some ideas for other simple experiments, including how to plan and conduct it.

Cycle B - Science – LKS2 – Unit 1: Working Scientifically

Objective
To conduct a scientific test

I wonder…
How can I make the best catapult with lolly sticks?

Substantive Knowledge (Content)

- To know that a catapult is a simple mechanism used to forcefully propel stones, spears, or other projectiles
- To know that a variable is an object, event, idea, feeling, time period, or any other type of category you are trying to measure
- To be able to change a variable
- To know that a fair test is a test where two or more things are compared. In order for a test to be fair or scientifically sound, children are required to ensure only one variable is changed.
- To be able to record results
- To be able to analyse results
- To be able to use knowledge to make predictions (what they think is going to happen)
- To be able to test out predictions (what they think is going to happen)

Prior Learning

EYFS
Children have learnt what scientists do.

KS1
Children have learnt how to conduct a simple comparative test.

Future Learning

UKS2
Children will be using scientific evidence to support or refute arguments.

KS3
Children will identify further questions arising from their results.

Skills

Ask and answer questions	Answering questions using data or information that they have not collected firsthand
Identify and classify	Identifying and naming materials/living things and organise them into groups
Observe	Observing or measuring how one variable changes over time
Data recording	Documenting facts and observations
Pattern spotting	Looking for relationships between two sets of data

Concepts

Responsibility	Working safely, how science can solve problems, climate change and sustainability
Similarity and difference	Making comparisons, finding patterns, noting differences and drawing conclusions
Cause and consequence	models and laws, reactions between materials, observing processes
Continuity and change	observing what changes and what stays the same
Significance	significant scientists, discoveries, laws, models and theories
Communication	Using scientific vocabulary, drawing, explaining, evaluating and interpreting data
Enquiry	Working scientifically, observing, classifying, patterns, fair testing, using evidence

Key vocabulary

fair test	An investigation where one variable is changed and all other conditions are kept the same
variable	Something that can be changed
prediction	Trying to tell what will happen in the future
evidence	Something that is used to support an argument
conclusion	Explaining the main points of something
observation	
results	
investigation	

Assessment points

- **Recognise** what a fair test is
- **Identify** variables
- **Observe** what happens when a variable is changed
- **Describe** what happened in an investigation
- **Record** data from the investigation
- **Compare** results for analysis
- **Answer** questions about the investigation
- **Evaluate** the success of the investigation

National Curriculum Coverage

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

Minimum expectations, including for pupils with SEND
Children will use equipment designed to help perform a simple test. With support, can explain what a fair test is.

High prior attainment and extension opportunities, including for pupils with SEND
Children to think about and discuss some ideas for other simple experiments, including how to make it a fair test.

Cycle B - Science – LKS2 – Unit 2: Animals, including humans

Objective
To know the main body parts associated with the digestive system

I wonder…
How do Italians eat pizza?

Substantive Knowledge (Content)

- To know that the digestive system consists of the parts of the body that work together to turn food and liquids into the building blocks and fuel that the body need
- To know that the main body parts involved with the digestive system are the mouth, oesophagus, stomach, small intestine, large intestine, rectum, and anus.
- To be able to describe the body parts in the digestive system
- To know that now that teeth are different shapes for different functions
- To know that the different types of teeth are incisors, canines, premolars, and molars
- To be able to describe the function of each type of tooth
- To know that a food chain is a sequence of events in an ecosystem, where one organism eats another. It begins with a primary source like the sun
- To know that a producer is a living thing that produces its own food
- To know that a consumer is a living thing that eats plants and other animals
- To know that a predator is a living thing that eats other animals

Prior Learning
EYFS
Children have identified creatures that can be found in the garden.

KS1
Children have learnt about different animal types.

Future Learning

UKS2
Children will be learning about the main parts and functions of the human circulatory system.

KS3
Children will be learning about the interaction between skeleton and muscles, including the measurement of force exerted by different muscles.

Skills

Ask and answer questions	Answering questions using data or information that they have not collected firsthand
Identify and classify	Identifying and naming materials/living things and organise them into groups
Observe	Observing or measuring how one variable changes over time
Data recording	Documenting facts and observations
Pattern spotting	Looking for relationships between two sets of data

Concepts

Responsibility	Working safely, how science can solve problems, climate change and sustainability
Similarity and difference	Making comparisons, finding patterns, noting differences and drawing conclusions
Cause and consequence	models and laws, reactions between materials, observing processes
Continuity and change	observing what changes and what stays the same
Significance	significant scientists, discoveries, laws, models and theories
Communication	Using scientific vocabulary, drawing, explaining, evaluating and interpreting data
Enquiry	Working scientifically, observing, classifying, patterns, fair testing, using evidence

Key vocabulary

digest	Break down food so it can be used by the body.
oesophagus	A muscular tube which moves food from the mouth to the stomach.
stomach	An organ in the digestive system where food is broken down with stomach acid.
small intestine	Part of the intestine where nutrients are absorbed into the body.
large intestine	Part of the intestine where water is absorbed from remaining waste food.
incisor	
canine	
molar	
rectum	
carnivore	
herbivore	
omnivore	
producer	
predator	
prey	
food chain	

Assessment points

- **Recognise** the main body parts in the digestive system
- **Identify** the main functions of body parts in the digestive system
- **Observe** the shape of different teeth
- **Describe** the differences between different teeth and their uses
- **Recall** what producer, prey and predator means
- **Record** a basic food chain
- **Compare** food chains
- **Answer** questions about the digestive system
- **Evaluate** the importance of the digestive system

National Curriculum Coverage

- Describe the simple functions of the basic parts of the digestive system in humans
- Identify the different types of teeth in humans and their simple functions
- Construct and interpret a variety of food chains, identifying producers, predators and prey

Minimum expectations, including for pupils with SEND
Children to identify some of the parts of the digestive system. With support, children can describe the simple of function of these parts.

High prior attainment and extension opportunities, including for pupils with SEND
Children to think about and discuss what is the most important part of the digestive system.

Cycle B - Science – LKS2 – Unit 3: Living things and their habitats

Objective
To understand that habitats can change throughout the year

I wonder…
Where do foxes live?

Substantive Knowledge (Content)

- To know that classification is putting things into groups by looking at similarities and differences between the way they look and behave
- To know that a classification key is a series of questions that determine an organism's physical characteristics
- To be able to classify living things that can be found in the local area
- To know that habitats and environments can change
- To know that changes to environment can pose a danger to living things
- To know that some living things are endangered or have become extinct and give reasons why this has happened

Prior Learning

EYFS
Children have learnt where many common animals live.

KS1
Children have learnt to identify and name habitats and their properties.

Future Learning

UKS2
Children will be classifying living things based on specific characteristics.

KS3
Children will be learning about reproduction in humans (as an example of a mammal), including the structure and function of the male and female reproductive systems.

Skills

Ask and answer questions	Answering questions using data or information that they have not collected firsthand
Identify and classify	Identifying and naming materials/living things and organise them into groups
Observe	Observing or measuring how one variable changes over time
Data recording	Documenting facts and observations
Pattern spotting	Looking for relationships between two sets of data
Comparative and fair testing	Observing or measuring the effect of changing one variable when controlling others

Concepts

Responsibility	Working safely, how science can solve problems, climate change and sustainability
Similarity and difference	Making comparisons, finding patterns, noting differences and drawing conclusions
Cause and consequence	models and laws, reactions between materials, observing processes
Continuity and change	observing what changes and what stays the same
Significance	significant scientists, discoveries, laws, models and theories
Communication	Using scientific vocabulary, drawing, explaining, evaluating and interpreting data
Enquiry	Working scientifically, observing, classifying, patterns, fair testing, using evidence

Key vocabulary

environment	An environment contains many habitats and include both living and non-living things.
classification	This is where plants or animals are placed into groups according to their similarities.
endangered	A plant or animal where there are not many of their species left
characteristics	The distinguishing features or qualities that are specific to a species.
habitat	The specific area or place in which particular animals or plants may live.
reproduction	
nutrition	
specimen	
vertebrate	
invertebrate	
extinct	

Assessment points

- **Recognise** what classification means
- **Identify** animals using a classification key
- **Observe** living things that can be found in the local area
- **Describe** how environments can change
- **Recall** some living things that are endangered or extinct
- **Record** how the size of shadows can change
- **Compare** different habitats and environments
- **Answer** questions about classification
- **Evaluate** why some living things are endangered

National Curriculum Coverage

- Recognise that living things can be grouped in a variety of ways
- Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment
- Recognise that environments can change and that this can sometimes pose dangers to living things

Minimum expectations, including for pupils with SEND
Children to know that habitats can change at different times of the year. With support, children can identify how habitats change throughout the year.

High prior attainment and extension opportunities, including for pupils with SEND
Children to think about and discuss what is the best season for squirrels or other animals.

Cycle B - Science – LKS2 – Unit 4: States of matter

Objective
To know that some materials change state when they are heated or cooled

I wonder…
What would happen if we put ice in a kettle?

Substantive Knowledge (Content)

- To know that there are three states of matter- solid, liquid, and gas. Solids have a definite shape and volume. Liquids have a definite volume, but take the shape of the container. Gases have no definite shape or volume
- To be able to comparing solids, liquids and gases
- To be able to describe what happens to materials when they are heated or cooled
- To know that water freezes at 0 °C and boils at 100°C
- To know that evaporation is the process by which a liquid turns into a gas due to being heated
- To know that condensation is the process by which a gas turns into a liquid due to being cooled
- To know that the water cycle is the transformation of water between different states through a series of natural processes

Prior Learning

EYFS
Children have explored different materials through play.

KS1
Children have learnt to identify, name and compare everyday materials.

Future Learning

UKS2
Children will be learning about the different states of matter.

KS3
Children will be learning about properties of ceramics, polymers and composites.

Skills

Ask and answer questions	Answering questions using data or information that they have not collected firsthand
Identify and classify	Identifying and naming materials/living things and organise them into groups
Observe	Observing or measuring how one variable changes over time
Data recording	Documenting facts and observations
Pattern spotting	Looking for relationships between two sets of data
Comparative and fair testing	Observing or measuring the effect of changing one variable when controlling others
Using models	Developing or evaluating a model or analogy that represents a scientific idea, phenomenon or process

Concepts

Responsibility	Working safely, how science can solve problems, climate change and sustainability
Similarity and difference	Making comparisons, finding patterns, noting differences and drawing conclusions
Cause and consequence	models and laws, reactions between materials, observing processes
Continuity and change	observing what changes and what stays the same
Significance	significant scientists, discoveries, laws, models and theories
Communication	Using scientific vocabulary, drawing, explaining, evaluating and interpreting data
Enquiry	Working scientifically, observing, classifying, patterns, fair testing, using evidence

Key vocabulary

state of matter	Materials that can be solid, liquid or gas
solid	Materials that keep their shape unless a force is applied to them
liquid	Take the shape of their container
gas	Gases can spread out to completely fill the container or room they are in.
evaporate	Turn a liquid into a gas
condense	
melt	
freeze	
water	
water vapour	
particles	

Assessment points

- **Recognise** solids, liquids and gases
- **Identify** materials that are solids, liquids and gases
- **Observe** what happens to materials when they are heated or cooled
- **Describe** what happens to materials when they are heated or cooled
- **Recall** the temperature that water freezes and boils
- **Record** a basic water cycle
- **Compare** the different states of matter
- **Answer** questions about materials changing state
- **Evaluate** what would happen if we put ice it a kettle

National Curriculum Coverage

- Compare and group materials together, according to whether they are solids, liquids or gases
- 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)
- Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature

Minimum expectations, including for pupils with SEND
Children to know that some materials change state when heated or cooled. With support, children can explain when water freezes and boils.

High prior attainment and extension opportunities, including for pupils with SEND
Children to think about and discuss what is the best dish for a bird water bowl.

Objective
To recognise how an electrical circuit works

I wonder…
What would happen if we pressed this switch?

Substantive Knowledge (Content)

- To be able to list some common appliances that run on electricity
- To know that an electrical circuit is a complete circular path that electricity flows through
- To know that the components (parts) of an electrical circuit include cells or batteries, switches, lamps, buzzers, motors and wires
- To be able to identify is an electrical circuit is complete or not
- To be able to change a circuit
- To know that a conductor allows electrical current to flow through it and an insulator will not
- To be able to name some conductors and insulators
- To know that electricity can kill and to be able to describe how to be safe around electricity

Prior Learning

EYFS
Children have learnt that some things need electricity to run.

KS1
Children have learnt that electricity can be dangerous.

Future Learning

UKS2
Children will be learning to recognise what happens in simple electrical circuits.

KS3
Children will be learning about potential difference, measured in volts, battery and bulb ratings; resistance, measured in ohms, as the ratio of potential difference (p.d.) to current

Skills

Ask and answer questions	Answering questions using data or information that they have not collected firsthand
Identify and classify	Identifying and naming materials/living things and organise them into groups
Observe	Observing or measuring how one variable changes over time
Data recording	Documenting facts and observations
Pattern spotting	Looking for relationships between two sets of data
Comparative and fair testing	Observing or measuring the effect of changing one variable when controlling others
Using models	Developing or evaluating a model or analogy that represents a scientific idea, phenomenon or process

Concepts

Responsibility	Working safely, how science can solve problems, climate change and sustainability
Similarity and difference	Making comparisons, finding patterns, noting differences and drawing conclusions
Cause and consequence	models and laws, reactions between materials, observing processes
Continuity and change	observing what changes and what stays the same
Significance	significant scientists, discoveries, laws, models and theories
Communication	Using scientific vocabulary, drawing, explaining, evaluating and interpreting data
Enquiry	Working scientifically, observing, classifying, patterns, fair testing, using evidence

Key vocabulary

electricity	The flow of an electric current through a material
generate	To make or produce
conductor	A material which easily allows heat and/or electricity to pass through it
insulator	A material which does not easily allow heat and/or electricity to pass through it
circuit	A pathway that electricity can flow around
cell	
switch	
bulb	
light	
appliances	
renewable	
non-renewable	

Assessment points

- **Recognise** some common appliances that run on electricity
- **Identify** parts in an electrical circuit
- **Observe** what happens in an electrical circuit
- **Describe** what each part of an electrical circuit does
- **Recall** the names of some conductors and insulators
- **Record** a basic electrical circuit
- **Compare** electrical circuits
- **Answer** questions about how to be safe around electricity
- **Evaluate** how an electrical circuit works

National Curriculum Coverage

- Identify common appliances that run on electricity
- Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers
- Identify whether 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
- Recognise some common conductors and insulators, and associate metals with being good conductors

Minimum expectations, including for pupils with SEND
Children to recognise that a switch open and closes a circuit. With support, children can identify if a lamp will light in a simple circuit.

High prior attainment and extension opportunities, including for pupils with SEND
Children to think about and discuss why electrical wires often have plastic tubes around them.

Objective
To know how sound travels

I wonder…
Can sound travel through water?

Substantive Knowledge (Content)

- To know that sound is made up of vibrations, or sound waves, that we can hear. These sound waves are formed by objects vibrating against something
- To know that sounds are detected through the ears
- To know that a sound wave is made when an object vibrates
- To know that sound travels fastest through solid materials like metal and wood. It travels quite fast through liquids like water. It still travels through gases like the air. Sound does not travel at all when there is no air
- To know that pitch means how high or low the sound is
- To know that volume means how loud or quiet a sound is
- To be able to find patterns involving pitch and volume
- To investigate what happens to sound when the distance from the source changes

Prior Learning

EYFS
Children have explored making sounds with different objects.

KS1
Children have learnt how to play tuned and untuned instruments.

Future Learning

KS3
Children will be learning about sound produced by vibrations of objects, in loud speakers, detected by their effects on microphone diaphragm and the ear drum; sound waves are longitudinal.

Skills

Ask and answer questions	Answering questions using data or information that they have not collected firsthand
Identify and classify	Identifying and naming materials/living things and organise them into groups
Observe	Observing or measuring how one variable changes over time
Data recording	Documenting facts and observations
Pattern spotting	Looking for relationships between two sets of data
Comparative and fair testing	Observing or measuring the effect of changing one variable when controlling others
Using models	Developing or evaluating a model or analogy that represents a scientific idea, phenomenon or process

Concepts

Responsibility	Working safely, how science can solve problems, climate change and sustainability
Similarity and difference	Making comparisons, finding patterns, noting differences and drawing conclusions
Cause and consequence	models and laws, reactions between materials, observing processes
Continuity and change	observing what changes and what stays the same
Significance	significant scientists, discoveries, laws, models and theories
Communication	Using scientific vocabulary, drawing, explaining, evaluating and interpreting data
Enquiry	Working scientifically, observing, classifying, patterns, fair testing, using evidence

Key vocabulary

vibration	A movement backwards and forwards
sound wave	Vibrations travelling from a sound source
volume	The loudness of a sound
pitch	How low or high a sound is
amplitude	The size of a vibration
fainter	
distance	
ear	
eardrum	
particles	
soundproof	
vacuum	
frequency	

Assessment points

- **Recognise** how sounds are made
- **Identify** sounds
- **Observe** what happens to soundwaves with different pitch/volume
- **Describe** how sounds are detected
- **Recall** what pitch and volume mean
- **Record** soundwaves with high/low pitch and volume
- **Compare** the soundwaves of the sounds different things make
- **Answer** questions about how sound travels
- **Measure** the distance that you can hear something
- **Evaluate** how sound travels

National Curriculum Coverage

- Identify how sounds are made, associating some of them with something vibrating
- Recognise that vibrations from sounds travel through a medium to the ear
- Find patterns between the pitch of a sound and features of the object that produced it
- Find patterns between the volume of a sound and the strength of the vibrations that produced it
- Recognise that sounds get fainter as the distance from the sound source increases

Minimum expectations, including for pupils with SEND
Children to know that sound is made from vibrations. With support, children can explain how distance affects sound.

High prior attainment and extension opportunities, including for pupils with SEND
Children to think about and discuss the volume and pitch of a sound by looking at its frequency.

Cycle B - Science – UKS2 – Unit 1: Evolution and Inheritance

Objective
To know that living things have changed, adapted and evolved over time

I wonder…
What is the best thing we can get from our parents?

Substantive Knowledge (Content)

- To know that fossils can tell us how life, landscapes, and climate have changed over time and how living things responded to those changes
- To be able to describe the stages of fossilisation: death, decomposition, transportation, weathering, burial, fossilization, erosion and discovery
- To know that evolution is the process by which living things can gradually change over time
- To know that inheritance is the process of passing on features from parents to offspring
- To know that offspring can vary from their parents
- To be able to describe how animals and plants are adapted to suit their environment
- Charles Darwin was a British naturalist who was born in The Mount House, Shrewsbury on the 12th February 1809. A naturalist is someone who studies things in nature such as animals and plants and how they live. He is best known for his theory of evolution

Prior Learning

EYFS
Children have learnt that they have changed over time from a baby until now.

KS1
Children have learnt about the lifecycle of some animals.

LKS2
Children have learnt about rocks formation and fossilisation.

Future Learning

KS3
Children will be learning about the variation between individuals within a species being continuous or discontinuous, to include measurement and graphical representation of variation.

Skills

Ask and answer questions	Answering questions using data or information that they have not collected firsthand
Identify and classify	Identifying and naming materials/living things and organise them into groups
Observe	Observing or measuring how one variable changes over time
Data recording	Documenting facts and observations
Pattern spotting	Looking for relationships between two sets of data
Comparative and fair testing	Observing or measuring the effect of changing one variable when controlling others
Using models	Developing or evaluating a model or analogy that represents a scientific idea, phenomenon or process

Concepts

Responsibility	Working safely, how science can solve problems, climate change and sustainability
Similarity and difference	Making comparisons, finding patterns, noting differences and drawing conclusions
Cause and consequence	models and laws, reactions between materials, observing processes
Continuity and change	observing what changes and what stays the same
Significance	significant scientists, discoveries, laws, models and theories
Communication	Using scientific vocabulary, drawing, explaining, evaluating and interpreting data
Enquiry	Working scientifically, observing, classifying, patterns, fair testing, using evidence

Key vocabulary

evolution	Adaptation over a very long time
inheritance	This is when the characteristics are passed on to offspring from their parents
variations	The differences between individuals within a species
adaptation	A trait changing to increase a living thing's chances of surviving and reproducing
offspring	The young animal or plant that is produced by reproduction of that species
natural selection	
fossil	
environment	
parents	
species	

Assessment points

- **Recognise** what fossils can tell us
- **Identify** the stages of fossilisation
- **Observe** how living things have evolved
- **Describe** how individuals in a species are not exact copies
- **Recall** who Charles Darwin was
- **Record** some characteristics that are passe down from parents
- **Compare** how humans have evolved over time
- **Answer** questions about evolution and inheritance
- **Evaluate** the importance of evolution

National Curriculum Coverage

- Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago
- Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents
- Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution

Minimum expectations, including for pupils with SEND
Children to understand that living things have changed over time. With support, children can explain what evolution is.

High prior attainment and extension opportunities, including for pupils with SEND
Children to think about and discuss what humans might look like in a million years.

Cycle B - Science – UKS2 – Unit 2: Animals, including humans

Objective
To know the main parts and functions of the human circulatory system

I wonder…
How does smoking affect the body?

Substantive Knowledge (Content)

- To know that the circulatory system is a network within the body that consists of blood, blood vessels, and the heart. It supplies tissues in the body with nutrients and oxygen, and also transports hormones and removes waste products that the body doesn't need
- To know that the main parts of the circulatory system are the heart, arteries, veins and blood
- To be able to describe the functions of the parts in the circulatory system
- To know that a lifestyle is the way a person chooses to live
- To be able to describe the effects diet, exercise and lifestyle can have
- To know that drugs change the way the body works by moving to the brain through the bloodstream and intensify or dull the senses
- To know that water and nutrients are transported around the body in the blood by the circulatory system

Prior Learning

EYFS
Children have identified creatures that can be found in the garden.

KS1
Children have learnt about different animal types.

LKS2
Children have learnt about the main body parts associated with the digestive system

Future Learning

KS3
Children will be learning about the interaction between skeleton and muscles, including the measurement of force exerted by different muscles.

Skills

Ask and answer questions	Answering questions using data or information that they have not collected firsthand
Identify and classify	Identifying and naming materials/living things and organise them into groups
Observe	Observing or measuring how one variable changes over time
Data recording	Documenting facts and observations
Pattern spotting	Looking for relationships between two sets of data

Concepts

Responsibility	Working safely, how science can solve problems, climate change and sustainability
Similarity and difference	Making comparisons, finding patterns, noting differences and drawing conclusions
Cause and consequence	models and laws, reactions between materials, observing processes
Continuity and change	observing what changes and what stays the same
Significance	significant scientists, discoveries, laws, models and theories
Communication	Using scientific vocabulary, drawing, explaining, evaluating and interpreting data
Enquiry	Working scientifically, observing, classifying, patterns, fair testing, using evidence

Key vocabulary

circulatory system	A system which includes the heart, veins, arteries, and blood transporting substances around the body
heart	An organ which constantly pumps blood around the circulatory system
blood vessels	Tube-like structures that carry blood through organs and tissue
blood	A liquid that carries nutrients and removes waste
nutrients	Substances that animals need to stay alive and healthy
transported	
exercise	
drugs	
lifestyle	
veins	
arteries	

Assessment points

- **Recognise** what the circulatory system is
- **Identify** the main parts of the circulatory system
- **Observe** what how the heart pumps blood
- **Describe** what blood vessels are
- **Recall** facts about the circulatory system
- **Record** how blood, water and nutrients travel around the body
- **Compare** the effects of different lifestyles
- **Answer** questions about the circulatory system
- **Evaluate** the effect that smoking has on the body

National Curriculum Coverage

- Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood
- Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function
- Describe the ways in which nutrients and water are transported within animals, including humans

Minimum expectations, including for pupils with SEND
Children to name the main parts of the circulatory system. With support, children can describe the function of the heart.

High prior attainment and extension opportunities, including for pupils with SEND
Children to think about and discuss why a healthy lifestyle is important.

Cycle B - Science – UKS2 – Unit 3: Living things and their habitats

Objective
To classify living things based on specific characteristics

I wonder…
Is this an animal or a plant?

Substantive Knowledge (Content)

- To be able to classify living things into broad groups based on specific characteristics
- To be able to use a classification key
- To know that microorganisms are tiny living things too small to be seen with the naked eye, more commonly known as 'germs', 'bugs' or 'microbes',
- To be able to use reasoning when classifying living things

Prior Learning

EYFS
Children have explored different materials through play.

KS1
Children have learnt to identify, name and compare everyday materials.

LKS2
Children have learnt to compare different kinds of rocks and soils.

Future Learning

KS3
Children will be learning about reproduction in humans (as an example of a mammal), including the structure and function of the male and female reproductive systems.

Skills

Ask and answer questions	Answering questions using data or information that they have not collected firsthand
Identify and classify	Identifying and naming materials/living things and organise them into groups
Observe	Observing or measuring how one variable changes over time
Data recording	Documenting facts and observations
Pattern spotting	Looking for relationships between two sets of data

Concepts

Responsibility	Working safely, how science can solve problems, climate change and sustainability
Similarity and difference	Making comparisons, finding patterns, noting differences and drawing conclusions
Cause and consequence	models and laws, reactions between materials, observing processes
Continuity and change	observing what changes and what stays the same
Significance	significant scientists, discoveries, laws, models and theories
Communication	Using scientific vocabulary, drawing, explaining, evaluating and interpreting data
Enquiry	Working scientifically, observing, classifying, patterns, fair testing, using evidence

Key vocabulary

characteristics	Special qualities or appearances that make an individual or group different to others
classify	To sort things into different groups
key	A series of questions about the characteristics of living things
species	A group of animals that can reproduce fertile offspring
microorganism	An organism that can only be seen using a microscope
microscope	
organism	
bacteria	
taxonomist	

Assessment points

- **Recognise** what classification is
- **Identify** specific characteristics of living things
- **Observe** what a taxonomist does
- **Describe** what a taxonomist does
- **Record** a basic classification key
- **Compare** living things to classify using a key
- **Answer** questions about classification
- **Evaluate** why classification is used

National Curriculum Coverage

- 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
- Give reasons for classifying plants and animals based on specific characteristics

Minimum expectations, including for pupils with SEND
Children to classify living things according to observable characteristics. With support, children can explain how living things have been classified.

High prior attainment and extension opportunities, including for pupils with SEND
Children to think about and discuss the reasons why we classifying living things.

Objective
To conduct a scientific investigation

I wonder…
What type of exercise affects the body the most?

Substantive Knowledge (Content)

- To be able to plan an investigation question
- To be able to take measurements
- To be able to record and display data in a scientific way i.e. a table or graph
- To be able to make predictions for further tests using prior knowledge or results
- To be able to report findings of an investigation using scientific vocabulary
- To know that a scientific argument is the examination of different viewpoints in order to reach a shared understanding of observed phenomena

Prior Learning

EYFS
Children have learnt what scientists do.

KS1
Children have learnt how to conduct a simple comparative test.

LKS2
Children have learnt how to conduct a fair test investigation.

Future Learning

KS3
Children will identify further questions arising from their results.

Skills

Ask and answer questions	Answering questions using data or information that they have not collected firsthand
Identify and classify	Identifying and naming materials/living things and organise them into groups
Observe	Observing or measuring how one variable changes over time
Data recording	Documenting facts and observations
Pattern spotting	Looking for relationships between two sets of data
Comparative and fair testing	Observing or measuring the effect of changing one variable when controlling others
Using models	Developing or evaluating a model or analogy that represents a scientific idea, phenomenon or process

Concepts

Responsibility	Working safely, how science can solve problems, climate change and sustainability
Similarity and difference	Making comparisons, finding patterns, noting differences and drawing conclusions
Cause and consequence	models and laws, reactions between materials, observing processes
Continuity and change	observing what changes and what stays the same
Significance	significant scientists, discoveries, laws, models and theories
Communication	Using scientific vocabulary, drawing, explaining, evaluating and interpreting data
Enquiry	Working scientifically, observing, classifying, patterns, fair testing, using evidence

Key vocabulary

investigation	Look into carefully and closely so as to learn the facts
analyse	A careful study of the parts of something in order to understand more about the whole
argument	A reason for or against something
reporting	To prepare and present an account or statement of something
relationship	How things are connected
prediction	
fair test	
evidence	
measuring	

Assessment points

- **Identify** what question can be investigated
- **Observe** what happens during an investigation
- **Describe** what happens during an investigation
- **Record** what happens during an investigation
- **Compare** measurements and results
- **Answer** questions about the investigation
- **Evaluate** the success of answering the investigation question

National Curriculum Coverage

- Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- Using test results to make predictions to set up further comparative and fair tests
- 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
- Identifying scientific evidence that has been used to support or refute ideas or arguments

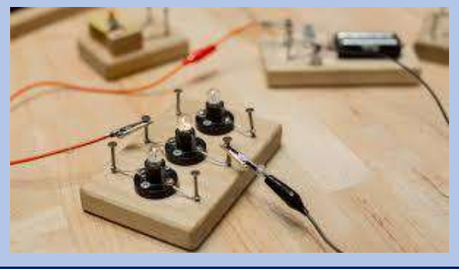
Minimum expectations, including for pupils with SEND
Children will identify something they would like to find out within an investigation. With support, children can conduct an investigation to find an answer to their question.

High prior attainment and extension opportunities, including for pupils with SEND
Children to think about and discuss some ideas for other experiments, and how the findings of their investigation can be presented.

Cycle B - Science – UKS2 – Unit 5: Electricity

Objective
To recognise what happens in simple electrical circuits

I wonder…
How can we stop a bank robber?



Substantive Knowledge (Content)

- To know the names of some electrical components i.e. cell, buzzer, light, wire, switch
- To be able to understand and use symbols in an electrical circuit
- To be able to draw an electrical circuit
- To know that voltage is a measure of how strong the current is in a circuit
- To be able to describe the impact voltage has on the effects of a circuit
- To be able to explain how electricity flows in a circuit

Prior Learning

EYFS
Children have learnt that some things need electricity to run.

KS1
Children have learnt that electricity can be dangerous.

LKS2
Children have learnt to recognise how an electrical circuit works.

Future Learning

KS3
Children will be learning about potential difference, measured in volts, battery and bulb ratings; resistance, measured in ohms, as the ratio of potential difference (p.d.) to current

Skills

Ask and answer questions	Answering questions using data or information that they have not collected firsthand
Identify and classify	Identifying and naming materials/living things and organise them into groups
Observe	Observing or measuring how one variable changes over time
Data recording	Documenting facts and observations
Pattern spotting	Looking for relationships between two sets of data
Comparative and fair testing	Observing or measuring the effect of changing one variable when controlling others
Using models	Developing or evaluating a model or analogy that represents a scientific idea, phenomenon or process

Concepts

Responsibility	Working safely, how science can solve problems, climate change and sustainability
Similarity and difference	Making comparisons, finding patterns, noting differences and drawing conclusions
Cause and consequence	models and laws, reactions between materials, observing processes
Continuity and change	observing what changes and what stays the same
Significance	significant scientists, discoveries, laws, models and theories
Communication	Using scientific vocabulary, drawing, explaining, evaluating and interpreting data
Enquiry	Working scientifically, observing, classifying, patterns, fair testing, using evidence

Key vocabulary

circuit	A path that an electrical current can flow around
voltage	The force that makes the electric current move through the wires
current	The flow of electrons
electrons	Very small particles that travel around a circuit
symbol	A visual picture that stands for something
buzzer	
switch	
lamp	
function	
volume	
brightness	
bulb	
amps	

Assessment points

- **Recognise** some electrical components
- **Identify** electrical components on a circuit diagram
- **Observe** what happens to a bulb/buzzer when the voltage is changed
- **Describe** how electricity flows through a circuit
- **Recall** what electrons are
- **Record** a simple circuit diagram
- **Compare** variations in how electrical components function
- **Answer** questions about electrical circuits
- **Evaluate** what happens in a circuit when the voltage is changed

National Curriculum Coverage

- Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit
- Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches
- Use recognised symbols when representing a simple circuit in a diagram

Minimum expectations, including for pupils with SEND
Children can recognise some symbols represented in a simple circuit diagram. With support, children can explain how to make a bulb brighter or dimmer.

High prior attainment and extension opportunities, including for pupils with SEND
Children to think about, discuss and design a circuit to help alert people to danger.

Cycle B - Science – UKS2 – Unit 6: Earth and Space

Objective
To describe the movement of the Earth and other planets in the solar system

I wonder…
What time does the morning start?

Substantive Knowledge (Content)

- To know the Sun is the centre of the solar system
- To know that Earth and other planets are in the solar system
- To know that the Earth orbits (moves around) the Sun and it takes approximately 365 days
- To know that the moon orbits (moves around) the Earth and it takes approximately 28 days
- To know the Sun, Earth and moon are spherical bodies
- To be able to explain how Earth's rotation creates the idea of night and day

Prior Learning

EYFS
Children have learnt about the sun.

KS1
Children have learnt about Earth and some of its features.

Future Learning

KS3
Children will be learning about the seasons and the Earth's tilt, day length at different times of year, in different hemispheres.

Skills

Ask and answer questions	Answering questions using data or information that they have not collected firsthand
Identify and classify	Identifying and naming materials/living things and organise them into groups
Observe	Observing or measuring how one variable changes over time
Data recording	Documenting facts and observations
Pattern spotting	Looking for relationships between two sets of data
Comparative and fair testing	Observing or measuring the effect of changing one variable when controlling others
Using models	Developing or evaluating a model or analogy that represents a scientific idea, phenomenon or process

Concepts

Responsibility	Working safely, how science can solve problems, climate change and sustainability
Similarity and difference	Making comparisons, finding patterns, noting differences and drawing conclusions
Cause and consequence	models and laws, reactions between materials, observing processes
Continuity and change	observing what changes and what stays the same
Significance	significant scientists, discoveries, laws, models and theories
Communication	Using scientific vocabulary, drawing, explaining, evaluating and interpreting data
Enquiry	Working scientifically, observing, classifying, patterns, fair testing, using evidence

Key vocabulary

solar system	Made up of the Sun and all of the smaller objects that move around it
orbit	To move in a regular, repeating curved pattern around another object
rotate	To spin
axis	An imaginary line that a body rotates around
Sun	A huge star that Earth and other planets in our solar system orbit around
planet	
moon	
spherical bodies	
night	

Assessment points

- **Recognise** what the solar system is
- **Identify** objects in the solar system
- **Observe** how the Earth, moon and other objects orbit
- **Describe** how night and day work
- **Record** how the Earth and moon move
- **Compare** the movement of Earth and the moon
- **Answer** questions about the movement of Earth
- **Evaluate** why we can see the moon at night and in the day

National Curriculum Coverage

- Describe the movement of the Earth, and other planets, relative to the Sun in the solar system
- Describe the movement of the Moon relative to the Earth
- Describe the Sun, Earth and Moon as approximately spherical bodies
- Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.

Minimum expectations, including for pupils with SEND
Children to know that planets move in relation to the sun. With support, children can describe how night and day work.

High prior attainment and extension opportunities, including for pupils with SEND
Children to think about and discuss why we sometimes see the moon in the day time.