Year	2	Topic	Living things and their habitat

Blue = Autumn 1 Purple = Spring 2 Red = covered in both terms

National Curriculum aims

- 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 micro-habitats
- Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food

Prior learning	Key vocabulary
• Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. (Y1 - Plants) • Identify and describe the basic structure of a variety of common flowering plants, including trees. (Y1 - Plants) • Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Y1 - Animals including humans) • Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals including humans) • Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). (Y1–Animals, including humans) • Observe changes across the four seasons. (Y1 - Seasonal changes)	living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed, water, air, survive, survival, conditions, light, dark, shady, sunny, wet, damp, dry, hot, cold names of local habitats (e.g. pond, woodland etc.), names of micro-habitats (e.g. under logs, in bushes etc.), names of living things in the habitats and micro-habitats studied

Common misconceptions

Some children may think:

- an animal's habitat is like its 'house'.
- plants and seeds are not alive as they cannot be seen to move
- fire is living
- arrows in a food chain mean 'eats'.

What pupils need to know or do to be secure

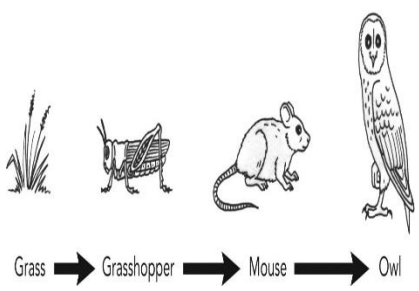
Key learning

All objects are either living, dead or have never been alive. Living things are plants (including seeds) and animals. Dead things include dead animals and plants and parts of plants and animals that are no longer attached e.g. leaves and twigs, shells, fur, hair and feathers (This is a simplification, but appropriate for Year 2 children.)

An object made of wood is classed as dead. Objects made of rock, metal and plastic have never been alive (again ignoring that plastics are made of fossil fuels).

Animals and plants live in a habitat to which they are suited, which means that animals have suitable features that help them move and find food and plants have suitable features that help them to grow well. The habitat provides the basic needs of the animals and plants – shelter, food and water.

- Within a habitat there are different micro-habitats e.g. in a woodland – in the leaf litter, on the bark of trees, on the leaves. These micro-habitats have different conditions e.g. light or dark, damp or dry. These conditions affect which plants and animals live there. The plants and animals in a habitat depend on each other for food and shelter etc. The way that animals obtain their food from plants and other animals can be shown in a food chain.



Key vocabulary with definitions

Living	Living things display movement, respiration, sensitivity, growth, reproduction, excretion, and nutrition (MRS GREN)	**Shelter**	Protection from the environment or predators
Dead	Something which was once living but is not any more.	**Survive**	Staying alive.
Suitable	Something which suits a particular need or purpose.	**Conditions**	What it is like within a particular habitat e.g. is it wet, dark, damp, dry?
Basic needs	The needs which must be met in order for something to stay alive.	**Food chain**	This shows how each living thing gets its food. A simple food chain might show grass – rabbit - fox

Activities

- Explore the outside environment regularly to find objects that are living, dead and have never lived.
- Classify objects found in the local environment.
- Observe animals and plants carefully, drawing and labelling diagrams.
- Create simple food chains for a familiar local habitat from first-hand observation and research.
- Create simple food chains from information given e.g. in picture books (Gruffalo etc.).

Future learning

- Recognise that living things can be grouped in a variety of ways. (Y4 - Living things and their habitats)
- Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. (Y4 - Living things and their habitats)
- Recognise that environments can change and that this can sometimes pose dangers to living things. (Y4 - Living things and their habitats)
- Construct and interpret a variety of food chains, identifying producers, predators and prey. (Y4 - Animals, including humans)

Possible evidence

For ARE

- Can sort into living, dead and never lived
- Can give key features that mean the animal or plant is suited to its micro-habitat
- Using a food chain can explain what animals eat
- Can explain in simple terms why an animal or plant is suited to a habitat e.g. the caterpillar cannot live under the soil like a worm as it needs fresh leaves to eat; the seaweed we found on the beach cannot live in our pond because it is not salty
- Can find a range of items outside that are living, dead and never lived
- Can name a range of animals and plants that live in a habitat and micro-habitats that they have studied
- Can talk about how the features of these animals and plants make them suitable to the habitat
- Can talk about what the animals eat in a habitat and how the plants provide shelter for them
- Can construct a food chain that starts with a plant and has the arrows pointing in the correct direction

For GD

- Compare animals found in familiar habitats with unfamiliar habitats
- Compare plants found in familiar habitats with unfamiliar habitats
- Use different factors to compare a range of habitats (e.g. water, light, temperature)

Working scientifically skills covered in this topic Autumn 1

Asking questions	➢ How do we know whether something is alive/dead or has never been alive? ➢ Predicting where habitats of living things will be
Using equipment	➢ Magnifying glasses to observe habitats
Observing	➢ Minibeast hunt – observing minbeasts ➢ Observing habitats carefully, drawing and labelling diagrams
Using other sources of information	➢ Research information about habitats ➢ Investigating animal food chains
Recording	➢ Recording minibeasts seen as a tally
Patterns/Groups	➢ Sort items dead and living using given information ➢ Create own food chains using known information about animal patterns e.g. carnivore/herbivore/ Omnivore

Working scientifically skills covered in this topic Spring 2

Asking questions	➢ How do we know whether something is alive/dead or has never been alive?
Simple tests	➢ Looking at selection of living/non-living/never alive things and following MRS GREN to test which category they fit into
Using equipment	➢ Magnifiying glasses to observe minibeasts ➢ Pond dipping
Fair tests	➢ Ensuring that they follow MRS GREN for each step of the living/non living test
Observing	➢ Making close observations using MRS GREN ➢ Pond dipping
Using other sources of information	➢ Research local habitats (pond at the school)
Recording	➢ Recording in a given table- MRS GREN test
Patterns/Groups	➢ Grouping things into living/non-living by investigating
Explaining results	➢ Simple explanations for how they know whether something is living/non-living

Year	2	Topic	Plants

National Curriculum aims

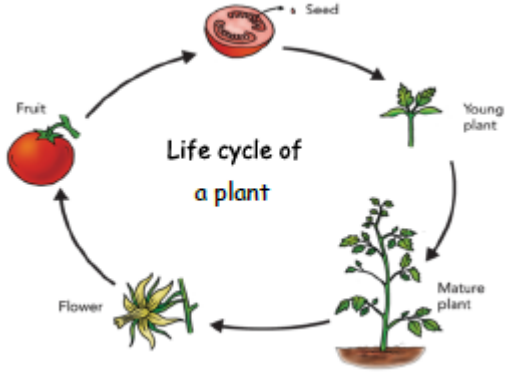
- Observe and describe how seeds and bulbs grow into mature plants.
- Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.

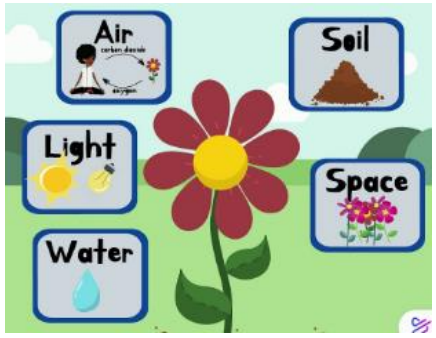
Prior learning	Key vocabulary
• Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. (Y1 - Plants) • Identify and describe the basic structure of a variety of common flowering plants, including trees. (Y1 - Plants)	light, shade, Sun, warm, cool, water, space, grow, healthy, bulb, germinate, shoot, seedling

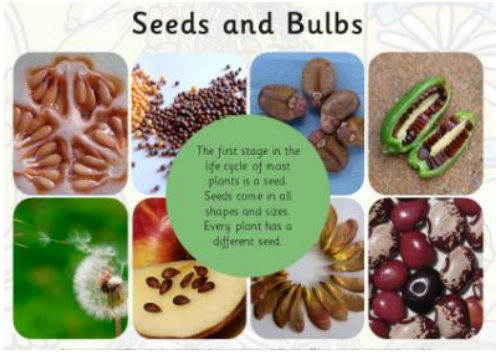
WHAT PUPILS NEED TO KNOW OR DO TO BE SECURE

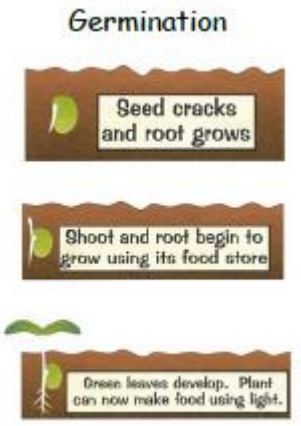
Key learning

Plants may grow from either seeds or bulbs. These then germinate and grow into seedlings which then continue to grow into mature plants. These mature plants may have flowers which then develop into seeds, berries, fruits etc. Seeds and bulbs need to be planted outside at particular times of year and they will germinate and grow at different rates. Some plants are better suited to growing in full sun and some grow better in partial or full shade. Plants also need different amounts of water and space to grow well and stay healthy.









Key vocabulary with definitions			
light	Energy and brightness from the sun.	**bulb**	The part of some plants that stores food whilst the plant is resting from growing.
shade	Areas where the light does not reach because something is blocking it.	**germinate**	When seeds grow into young plants.
sun	The closest star to Earth and source of all our heat and light.	**shoot**	The above-ground part of the plant that bears the buds and stems.
grow	Increase in size and weight.	**seedling**	A young plant grown from a seed.
healthy	To be free from sickness or illness.	**space**	Room for the plant to survive and grow.

Common misconceptions

Some children may think:

- plants are not alive as they cannot be seen to move
- seeds are not alive
- all plants start out as seeds
- seeds and bulbs need sunlight to germinate.

Activities

- Make close observations of seeds and bulbs.
- Classify seeds and bulbs.
- Research and plan when and how to plant a range of seeds and bulbs.
- Look after the plants as they grow – weeding, thinning, watering etc.
- Make close observations and measurements of their plants growing from seeds and bulbs.
- Make comparisons between plants as they grow.

Future learning

Possible evidence

For ARE

- Can spot similarities and difference between bulbs and seeds
- Can nurture seeds and bulbs into mature plants identifying the different requirements of different plants
- Can describe how plants that they have grown from seeds and bulbs have developed over time
- Can identify plants that grew well in different conditions

For GD

- Explain how to look after a variety of plants
- Compare the plant cycle for a plant from a seed with that from a bulb
- Know that a seed and bulb both contain everything a plant needs to grow

• Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. (Y3 - Plants) • Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant. (Y3 - Plants) • Investigate the way in which water is transported within plants. (Y3 - Plants) • Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. (Y3 - Plants)	• Explain that seeds and bulbs do not need light to germinate and identify how this is different to the needs of a plant • Explain how plants in the desert survive with little water and plants in the rainforest survive with little light

Working scientifically skills covered in this topic

Asking questions	➢ Predicting conditions for things to grow ➢ Questioning whether different seeds/bulbs will grow differently.
Simple tests	➢ Predicting conditions for things to grow ➢ Testing whether different seeds/bulbs grow differently
Using equipment	➢ Measure plant growth using rulers
Fair tests	➢ Compare growth of a range of seeds and bulbs grown in fair test conditions
Observing	➢ Make close observations of seeds and bulbs.
Measuring	➢ Measuring plant growth using rulers
Recording	➢ Keep a seed diary to record growth patterns
Patterns Groups	➢ Classify seeds and bulbs.
Explaining results	➢ Present results to compare growth of different seeds and bulbs

Year	2	Topic	Animals, including humans

- 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.

Prior learning	Key vocabulary
• Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals, including humans) • Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans)	offspring, reproduction, growth, baby, toddler, child, teenager, adult, old person, names of animals and their babies (e.g. chick/hen, kitten/cat, caterpillar/butterfly), survive, survival, water food, air, exercise, heartbeat, breathing, hygiene, germs, disease, food types (e.g. meat, fish, vegetables, bread, rice, pasta, dairy)

Key vocabulary with definitions			
Offspring	The child of a person or animal.	**Survive**	To stay alive
Reproduction	To create or recreate something, usually a new living thing, such as a baby.	**Exercise**	To keep the body healthy through being active.
Growth	To increase in size and/or weight.	**Heartbeat**	When your heart pumps blood around your body.
Baby	A human when it is first born, usually until it is able to walk or talk.	**Breathing**	The movement of air in and out of your lungs.
Toddler	A human who is learning to walk and talk.	**Hygiene**	Keeping yourself clean and protected from germs.
Child	Usually used to mean human below teenage years, although officially you remain a child until you reach 18.	**Germs**	Tiny living things that can cause disease.
Teenager	A human between the ages of 13 and 19.	**Disease**	Illnesses or sicknesses.
Adult	A human over the age of 18	**Food types**	Different sorts of foods which do different jobs within our bodies.

WHAT PUPILS NEED TO KNOW OR DO TO BE SECURE

Key learning

Animals, including humans, have offspring which grow into adults. In humans and some animals, these offspring will be young, such as babies or kittens, that grow into adults. In other animals, such as chickens or insects, there may be eggs laid that hatch to young or other stages which then grow to adults. The young of some animals do not look like their parents e.g. tadpoles.

All animals, including humans, have the basic needs of feeding, drinking and breathing that must be satisfied in order to survive. To grow into healthy adults, they also need the right amounts and types of food and exercise. Good hygiene is also important in preventing infections and illnesses.

Activities

- Ask people questions and use secondary sources to find out about the life cycles of some animals.
- Observe animals growing over a period of time e.g. chicks, caterpillars, a baby.
- Ask questions of a parent about how they look after their baby.
- Ask pet owners questions about how they look after their pet.
- Explore the effect of exercise on their bodies.
- Classify food in a range of ways, including using the Eatwell Guide.
- Investigate washing hands, using glitter gel.

Future learning

- Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat. (Y3 - Animals, including humans)
- Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. (Y5 - Living things and their habitats)
- Describe the life process of reproduction in some plants and animals. (Y5 - Living things and their habitats)
- Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. (Y6 - Animals, including humans)

Possible evidence

For ARE

- Can describe, including using diagrams, the life cycle of some animals, including humans, and their growth to adults e.g. by creating a life cycle book for a younger child
- Can measure/observe how animals, including humans, grow.
- Show what they know about looking after a baby/animal by creating a parenting/pet owners' guide
- Explain how development and health might be affected by differing conditions and needs being met/not met
- Can describe how animals, including humans, have offspring which grow into adults, using the appropriate names for the stages
- Can state the basic needs of animals, including humans, for survival
- Can state the importance for humans of exercise, eating the right amounts of different types of food, and hygiene
- Can name foods in each section of the Eatwell Guide

For GD

- Explain how to look after a pet describing what it needs to survive
- Use evidence to show that adult animals no longer grow
- Use evidence to show that children of the same age are not all the same size
- Use evidence to show that older children are generally taller than younger children

Common misconceptions

Some children may think:

- an animal's habitat is like its 'home'
- all animals that live in the sea are fish
- respiration is breathing
- breathing is respiration.

Working scientifically skills covered in this topic

Asking questions	➢ What do we need to do to keep our bodies healthy? ➢ What is the life cycle of a butterfly?
Simple tests	➢ Predicting what will happen next in a butterfly life cycle
Using equipment	➢
Fair tests	➢
Observing	➢ Observing closely the life cycle of a butterfly in the classroom
Measuring	➢
Using other sources of information	➢ Conditions humans need to survive ➢ Research butterfly life cycles using books, videos and powerpoints
Recording	➢ Recording life cycle of a butterfly ➢ Diagrams showing butterfly life cycle
Explain results	➢ Write an explanation text about the butterfly life cycle (in English lessons)

Year	2	Topic	Uses of everyday materials

Blue = covered in Autumn 2 **Purple = covered in Spring 1** **Red = covered in both terms**

National Curriculum aims

- 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.

Prior learning	Key vocabulary
• Distinguish between an object and the material from which it is made. (Y1 - Everyday materials) • Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. (Y1 - Everyday materials) • Describe the simple physical properties of a variety of everyday materials. (Y1 - Everyday materials) • Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Y1 - Everyday materials)	**Names of materials** – wood, metal, plastic, glass, brick, rock, paper, cardboard **Properties of materials** – opaque, transparent and translucent, reflective, non-reflective, flexible, rigid Shape, push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching

WHAT PUPILS NEED TO KNOW OR DO TO BE SECURE

Key learning

All objects are made of one or more materials that are chosen specifically because they have suitable properties for the task. For example, a water bottle is made of plastic because it is transparent allowing you to see the drink inside and waterproof so that it holds the water. A material can be suitable for different purposes and an object can be made of different materials.

Objects made of some materials can be changed in shape by bending, stretching, squashing and twisting.

Squashing

Twisting

Stretching

Bending

Uses of common materials	
Wood can be used for:	Doors, tables, cutlery
Plastic can be used for:	Pens, rulers, cutlery
Glass can be used for:	Windows, glasses
Metal can be used for:	Cars, coins, cutlery
Rock can be used for:	Garden walls, old buildings
Brick can be used for:	Houses, walls
Paper can be used for:	School books, wrapping paper
Card can be used for:	Folders, birthday cards

People we need to know	
John Dunlop	• Born in 1840 • An expert in rubber • Invented the first inflatable tyre
Charles Macintosh	• Born in 1766 • Invented the first waterproof fabric • The 'mac' raincoat is named after him
John McAdam	• Born in 1756 • He invented building roads with a smooth, hard surface.

Key vocabulary with definitions			
Material	The substance that an object is made from.	**Flexible**	Something that can easily bend without breaking.
Opaque	Cannot be seen through and does not allow light to pass through it.	**Rigid**	Something that is strong and will not bend.
Translucent	Lets light pass through, but objects on the other side can't be seen clearly	**Twist**	Change the shape of an object by turning it.
Transparent	Light completely passes through it, and you can see clearly through it.	**Bend**	Changing a straight object so that it is curved.
Reflective	It provides a reflection (a mirror image).	**Stretch**	Made longer or wider without tearing or breaking.
Non-reflective	It does not provide a reflection (a mirror image).	**Squash**	Crush something so that it becomes flat, soft, or out of shape.
Waterproof	Something that keeps water out.	**Absorbent**	Materials that soak up liquid.

Common misconceptions
Some children may think: • only fabrics are materials • only building materials are materials • only writing materials are materials • the word rock describes an object rather than a material • solid is another word for hard.

Activities

- Classify objects based on the materials they are made from.
- Classify materials based on their properties.
- Make suggestions about alternative materials for a purpose that are both suitable and unsuitable
- Test the properties of materials for particular uses e.g. compare the stretchiness of fabrics to select the most appropriate for Elastigirl's costume, test materials for absorbency to select the most appropriate for a liquid spill.

Future learning

- Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. (Y3 - Rocks)
- Notice that some forces need contact between two objects, but magnetic forces can act at a distance. (Y3 - Forces and magnets)
- Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. (Y5 - Properties and changes of materials)
- Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. (Y5 - Properties and changes of materials)

Possible evidence

For ARE

- Can name an object and say what material it is made from
- Can label a picture or diagram of an object made from different materials
- Can identify the properties of a given material
- For a given object can identify what properties a suitable material needs to have
- Can sort materials using a range of properties
- Can explain using the key properties why a material is suitable or not suitable for a purpose
- Can begin to choose an appropriate method for testing a material for a particular property
- Can use their test evidence to select appropriate material for a purpose e.g. Which material is the best for a rain hat?
- Whilst changing the shape of an object can describe the action used
- Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching
- Can use the words flexible and/or stretchy to describe materials that can be changed in shape and stiff and/or rigid for those that cannot
- Can recognise that a material may come in different forms which have different properties
- Describe how scientists have invented new materials (e.g. Macintosh, Dunlop)

For GD

- Explain why some materials change shape when a force acts (i.e. push, pull, twist, stretch) as a result of their properties
- Explain why one material may be more suitable for a purpose than another by discussing properties
- Explain why plastics cause problems in the oceans
- Explain the importance of reusing and recycling plastic
- Describe how swimsuits have changed over time and how the fabric is now more suitable

Working scientifically skills covered in this topic Autumn 2

Asking questions	➢ Asking questions about the suitability of materials for different purposes ➢ What materials are absorbent?
Simple tests	➢ Exploring properties of materials, ➢ Making predictions
Using equipment	➢ Using weights ➢ Using beakers and rulers
Fair tests	➢ Ensuring fair testing of absorbent materials
Observing	➢ Observing whether materials are absorbent ➢ Observing materials
Measuring	➢ Weighing In gms ➢ Using measuring beakers – ml ➢ Using rulers – cm
Recording	➢ Recording in a given table. - uses of materials - sorting materials based on properties ➢ Recording a simple table of absorbency
Using other sources of information	➢ Researching Charles MacIntosh
Patterns/Groups	➢ Identify and group every day materials ➢ Sorting materials by properties ➢ Grouping materials into absorbent/non-absorbent
Explaining groups	➢ Explain results eg suitability of every day materials ➢ Absorbency test results ➢ Strength of materials

Working scientifically skills covered in this topic Spring 1

Asking questions	➢ What materials are best for elastigirl's costume?
Simple tests	➢ Planning test for testing stretchiness of materials
Measuring	➢ Using rulers to measure stretchiness
Fair test	➢ Ensuring fair testing of stretching experiment
Observing	➢ Making observations about the stretchiness of materials
Measuring	➢ Measuring in cms
Recording	➢ Recording stretchiness in a bar chart
Using other sources of information	➢ Researching John McAdam / Dunlop – which one? Or both?
Patterns Groups	➢ What do we notice about our results? Which materials were more/less stretchy? Can we group them in any way?
Explaining groups	➢ Explaining which material would work best and why based on test results