



INSPIRE NURTURE BELIEVE ACHIEVE

Working together to be the best that we can be.

Happiness

Perserverance

Resilience

Kindness

Friendship

Respect

Science: Plant and Living Things Progression of Skills and Milestones Document

EYFS: Plants

- Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world. (30-50 months)
- Can talk about some of the things they have observed such as plants, animals, natural and found objects. (30-50 months)
- Looks closely at similarities, differences, patterns and change. (40-60 months)
- Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur, and talk about changes. (Early Learning Goal)

Notes:

Use correct terms so that, e.g. children will enjoy naming a chrysalis if the practitioner uses its correct name.

Pose carefully framed open-ended questions, such as “How can we...?” or “What would happen if...?”.

Provide stimuli and resources for children to create simple maps and plans, paintings, drawings and models of observations of known and imaginary landscapes.

Use the local area for exploring both the built and the natural environment.

Give opportunities to design practical, attractive environments, for example, taking care of the flowerbeds or organising equipment outdoors.

Year 1: Plants

- identify and name a variety of common wild and garden plants, including deciduous and evergreen trees
- identify and describe the basic structure of a variety of common flowering plants, including trees



Notes:

Pupils should use the local environment throughout the year to explore and answer questions about plants growing in their habitat. Where possible, they should observe the growth of flowers and vegetables that they have planted.

They should become familiar with common names of flowers, examples of deciduous and evergreen trees, and plant structures (including leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, and stem). Pupils might work scientifically by: observing closely, perhaps using magnifying glasses, and comparing and contrasting familiar plants; describing how they were able to identify and group them, and drawing diagrams showing the parts of different plants including trees. Pupils might keep records of how plants have changed over time, for example, the leaves falling off trees and buds opening; and compare and contrast what they have found out about different plants.

Key Vocabulary	Common Misconceptions
<p>Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud Names of trees in the local area Names of garden and wild flowering plants in the local area</p>	<p>Some children may think:</p> <ul style="list-style-type: none"> plants are flowering plants grown in pots with coloured petals and leaves and a stem trees are not plants all leaves are green • all stems are green a trunk is not a stem blossom is not a flower.
Activities	Possible Evidence
<ul style="list-style-type: none"> Make close observations of leaves, seeds, flowers etc. Compare two leaves, seeds, flowers etc. Classify leaves, seeds, flowers etc. using a range of characteristics. • Identify plants by matching them to named images. Make observations of how plants change over a period of time. When further afield, spot plants that are the same as those in the local area studied regularly, describing the key features that helped them. <p><i>TAPS practical assessments to be used at the end of each unit.</i></p>	<ul style="list-style-type: none"> Can name trees and other plants that they see regularly Can describe some of the key features of these trees and plants e.g. the shape of the leaves, the colour of the flower/blossom Can point out trees which lost their leaves and those that kept them the whole year Can point to and name the parts of a plant, recognising that they are not always the same e.g. leaves and stems may not be green Can sort and group parts of plants using similarities and differences Can use simple charts etc. to identify plants Can collect information on features that change during the year Can use photographs to talk about how plants change over time <p><i>'Concept Cartoons' and 'Exit Cards' to be used at the end of lessons to assess understanding.</i></p>

Proof of Progress (Working Towards, Age Related Expectation or Greater Depth)

<p>Identify and name a variety of common plants, including garden plants, wild plants and trees and those classified as deciduous and evergreen.</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Basic</p> <p>What are the names of some common wild plants?</p> <p>What are the names of some common garden plants?</p> <p>What are the names of some common trees?</p> <p>Which trees are evergreen and which are deciduous? (name)</p> </div> <div style="text-align: center;"> <p>Advancing</p> <p>What are the similarities and differences between deciduous and evergreen trees?</p> <p>Think of some ways to categorise plants.</p> </div> <div style="text-align: center;"> <p>Deep</p> <p>Suggest a garden design for someone who likes privacy and bright autumn colours.</p> <p><small>See an example on page 105</small></p>  </div> </div>	<p>Identify and describe the basic structure of a variety of common flowering plants, including roots, stem/trunk, leaves and flowers.</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Basic</p> <p>What are the names of parts of flowering plants?</p> <p>Describe the structure (names) of each part of a flowering plant.</p> </div> <div style="text-align: center;"> <p>Advancing</p> <p>Taking a selection of (real) different flowering plants, what are the structural features? (apply)</p>  </div> <div style="text-align: center;"> <p>Deep</p> <p>Are roots always at the bottom of plants? (generalise)</p> <p>Why do you think that is? (explain concept)</p> <p><small>See an example on page 104</small></p> </div> </div>	
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Year 2: Plants

- 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

Notes:

Pupils should use the local environment throughout the year to observe how plants grow. Pupils should be introduced to the requirements of plants for germination, growth and survival, as well as the processes of reproduction and growth in plants.

Note: seeds and bulbs need water to grow but most do not need light; seeds and bulbs have a store of food inside them.

Pupils might work scientifically by: observing and recording, with some accuracy, the growth of a variety of plants as they change over time from a seed or bulb, or observing similar plants at different stages of growth; setting up a comparative test to show that plants need light and water to stay healthy.

Key Vocabulary	Common Misconceptions
As for Year 1 plus light, shade, sun, warm, cool, water, grow, healthy	Some children may think: <ul style="list-style-type: none"> • 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	Possible Evidence
<ul style="list-style-type: none"> • 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. <p><i>TAPS practical assessments to be used at the end of each unit.</i></p>	<ul style="list-style-type: none"> • Can describe how plants that they have grown from seeds and bulbs have developed over time • Can identify plants that grew well in different condition • Can spot similarities and difference between bulbs and seeds • Can nurture seeds and bulbs into mature plants identifying the different requirements of different plants <p><i>‘Concept Cartoons’ and ‘Exit Cards’ to be used at the end of lessons to assess understanding.</i></p>

Key Stage 1 Working Scientifically

- Observing closely, using simple equipment
- Using their observations and ideas to suggest answers to questions

Children explore the world around them. They make careful observations to support identification, comparison and noticing change. They use appropriate senses, aided by equipment such as magnifying glasses or digital microscopes, to make their observations. They begin to take measurements, initially by comparisons, then using non-standard units.

Children use their experiences of the world around them to suggest appropriate answers to questions. They are supported to relate these to their evidence e.g. observations they have made, measurements they have taken or information they have gained from secondary sources. The children recognise 'biggest and smallest', 'best and worst' etc. from their data.

Proof of Progress (Working Towards, Age Related Expectation or Greater Depth)

Observe and describe how seeds and bulbs grow into mature plants.

Basic

Describe the growth of seeds and bulbs.

Advancing

What are the similarities and differences in the growth of seeds and bulbs?

Deep

What might a scientist need to keep in mind when recording information about the growth of seeds and bulbs? (propose)

See an example on page 182

Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.

Basic

What do plants need to stay healthy? (describe, list)

Advancing

How could you try to revive these plants? (apply) (Give pupils: a dried out plant, one that's been in the fridge, one that's been kept in the dark etc.)

Deep

Devise a way of proving that plants need certain conditions for growth.

See an example on page 180

End of Key Stage 1 Age Related Expectations

Milestone indicator	Basic	Advancing	Deep
Identify and name a variety of common plants, including garden plants, wild plants and trees and those classified as deciduous and evergreen.	<p>What are the names of common wild plants?</p> <p>What are the names of some common garden plants?</p> <p>What are the names of common trees?</p> <p>Which trees are evergreen and which are deciduous? (name)</p>	<p>What are the similarities and differences between deciduous and evergreen trees?</p> <p>Think of some ways to categorise plants.</p>	<p>Could you suggest a garden design for someone who likes privacy and bright autumn colours?</p>
Identify and describe the basic structure of a variety of common flowering plants, including roots, stem/trunk, leaves and flowers.	<ul style="list-style-type: none"> What are the names the parts of flowering plants? <p>What is the structure (names) of each part of a flowering plant?</p>	<p>Taking a selection of (real) different flowering plants, what are the structural features? (apply)</p>	<p>Are roots always at the bottom of plants (generalise)?</p> <p>Why do you think that is? (explain concept)</p>
Observe and describe how seeds and bulbs grow into mature plants.	<p>Describe the growth of seeds and bulbs.</p>	<ul style="list-style-type: none"> What are the similarities and differences in the growth of seeds and bulbs? 	<ul style="list-style-type: none"> What might a scientist need to keep in mind when recording information about the growth of seeds and bulbs? (propose)
Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	<ul style="list-style-type: none"> What do plants need to stay healthy? (describe, list) 	<ul style="list-style-type: none"> How could you try to revive these plants? (apply) [Give pupils a dried out plant, one thats been in a fridge, one thats been kept in the dark etc?] 	<ul style="list-style-type: none"> How could you devise a way of proving that plants need certain conditions for growth?

Year 2: Living Things and their Habitats

- 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

Notes:

Pupils should be introduced to the idea that all living things have certain characteristics that are essential for keeping them alive and healthy. They should raise and answer questions that help them to become familiar with the life processes that are common to all living things. Pupils should be introduced to the terms 'habitat' (a natural environment or home of a variety of plants and animals) and 'microhabitat' (a very small habitat, for example for woodlice under stones, logs or leaf litter). They should raise and answer questions about the local environment that help them to identify and study a variety of plants and animals within

their habitat and observe how living things depend on each other, for example, plants serving as a source of food and shelter for animals. Pupils should compare animals in familiar habitats with animals found in less familiar habitats, for example, on the seashore, in woodland, in the ocean, in the rainforest.

Pupils might work scientifically by: sorting and classifying things according to whether they are living, dead or were never alive, and recording their findings using charts. They should describe how they decided where to place things, exploring questions like: 'Is a flame alive? Is a deciduous tree dead in winter?' and talk about ways of answering their questions. They could construct a simple food chain that includes humans (eg, grass, cow, human). They could describe the conditions in different habitats and microhabitats (under log, on stony path, under bushes); and find out how the conditions affect the number and type(s) of plants and animals that live there.

Key Vocabulary	Common Misconceptions
<p>Living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed</p> <p>Names of local habitats e.g. pond, woodland etc. • Names of micro-habitats e.g. under logs, in bushes etc</p>	<p>Some children may think:</p> <ul style="list-style-type: none"> • an animal's habitat is like its 'home' • plants and seeds are not alive as they cannot be seen to move • fire is living • arrows in a food chain mean 'eats'.
Activities	Possible Evidence
<ul style="list-style-type: none"> • 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.). <p><i>TAPS practical assessments to be used at the end of each unit.</i></p>	<ul style="list-style-type: none"> • 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 • 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 <p><i>'Concept Cartoons' and 'Exit Cards' to be used at the end of lessons to assess understanding.</i></p>

Key Stage 1 Working Scientifically

- Identifying and classifying
- Asking simple questions and recognising that they can be answered in different ways

Children use their observations and testing to compare objects, materials and living things. They sort and group these things, identifying their own criteria for sorting. They use simple secondary sources (such as identification sheets) to name living things. They describe the characteristics they used to identify a living thing.

While exploring the world, the children develop their ability to ask questions (such as what something is, how things are similar and different, the ways things work, which alternative is better, how things change and how they happen). Where appropriate, they answer these questions. The children answer questions developed with the teacher often through a scenario. The children are involved in planning how to use resources provided to answer the questions using different types of enquiry, helping them to recognise that there are different ways in which questions can be answered.

Proof of Progress (Working Towards, Age Related Expectation or Greater Depth)

Explore and compare the differences between things that are living, that are dead and things that have never been alive.

Basic

Observe and list the key features of things that are living, dead and that have never been alive.

Describe things as living, dead or never been alive.

Advancing

Organise things of your choice into groups: living, dead and never been alive.

Deep

Give evidence to show that a glass bottle has never been alive.

See an example on page 116



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.

Basic

Observe animals/plants in their natural habitats.

Match the animal/plant to its habitat.

Describe why the animal/plant is suited to its environment.

Advancing

Categorise animals/plants according to the conditions they require.

Explain your categories.

Deep

Suggest reasons why a cactus may find it difficult to survive in cold, wet conditions.

Create an ideal environment for woodlice and prove that this is a successful habitat.

See an example on page 116

Identify and name a variety of plants and animals in their habitats, including micro-habitats.

Basic

Match common animals/plants to their habitats.

Advancing

Explain why a habitat for a particular plant or animal is suitable.

Deep

Design an ideal habitat for a hamster (or other animal) that is kept as a pet.

See an example on page 116

Create a bottle garden for plants that require warm, dry conditions.

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.

Basic

What does a (name of animal) like to eat? (name)

Draw a food chain that ends with a sparrow hawk.

Name sources of food.

Advancing

Explain the differences in a food chain for a herbivore and a carnivore.



Deep

Always, sometimes or never? Food chains end with a carnivore.

See an example on page 117

End of Key Stage 1 Age Related Expectations

Milestone indicator	Basic	Advancing	Deep
Explore and compare the differences between things that are living, that are dead and that have never been alive.	<p>Observe and list the key features of things that are living, dead and that have never been alive.</p> <p>Describe things as living, dead or never been alive.</p>	<p>Organise things of your choice into groups: living, dead and never been alive.</p>	<p>Give evidence to show that a glass bottle has never been alive.</p>
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.	<p>Observe animals/plants in their natural habitats.</p> <p>Match the animal/plant to its habitat.</p> <p>Describe why the animal/plant is suited to its environment.</p>	<p>Categorise animals/plants according to the conditions they require.</p> <p>Explain your categories.</p>	<p>Suggest reasons why a cactus may find it difficult to survive in cold, wet conditions.</p> <p>Create an ideal environment for woodlice and prove that this is a successful habitat.</p>
Identify and name a variety of plants and animals in their habitats, including micro-habitats.	<p>Match common animals/plants to their habitats.</p>	<p>Explain why a habitat for a plant or animal is suitable.</p>	<p>Design an ideal habitat for a hamster (or other animal that is kept as a pet).</p> <p>Create a bottle garden for plants that require warm, dry conditions.</p>
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.	<p>What does a (name of animal) like to eat? (name)</p> <p>Draw a food chain that ends with a sparrow hawk.</p> <p>Name sources of food.</p>	<p>Explain the differences in a food chain for a herbivore and a carnivore.</p>	<p>Always, sometimes or never? All food chains end with a carnivore.</p>

Year 3: Plants

- identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers
- 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
- investigate the way in which water is transported within plants
- explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal

Notes:

Pupils should be introduced to the relationship between structure and function: the idea that every part has a job to do. They should explore questions that focus on the role of the roots and stem in nutrition and support, leaves for nutrition and flowers for reproduction.

Note: pupils can be introduced to the idea that plants can make their own food, but at this stage they do not need to understand how this happens.

Pupils might work scientifically by: comparing the effect of different factors on plant growth, for example, the amount of light, the amount of fertiliser; discovering how seeds are formed by observing the different stages of plant life cycles over a period of time; looking for patterns in the structure of fruits that relate to how the seeds are dispersed. They might observe how water is transported in plants, for example, by putting cut, white carnations into coloured water and observing how water travels up the stem to the flowers.

Key Vocabulary

Photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersal)

Common Misconceptions

Some children may think:

- plants eat food • food comes from the soil via the roots
- flowers are merely decorative rather than a vital part of the life cycle in reproduction
- plants only need sunlight to keep them warm
- roots suck in water which is then sucked up the stem.

Activities

- Observe what happens to plants over time when the leaves or roots are removed.
- Observe the effect of putting cut white carnations or celery in coloured water.
- Investigate what happens to plants when they are put in different conditions e.g. in darkness, in the cold, deprived of air, different types of soil, different fertilisers, varying amount of space.
- Spot flowers, seeds, berries and fruits outside throughout the year. • Observe flowers carefully to identify the pollen.
- Observe flowers being visited by pollinators e.g. bees and butterflies in the summer.

Possible Evidence

- Can explain the function of the parts of a flowering plant
- Can describe the life cycle of flowering plants, including pollination, seed formation, seed dispersal, and germination
- Can give different methods of pollination and seed dispersal, including examples
- Can explain observations made during investigations
- Can look at the features of seeds to decide on their method of dispersal
- Can draw and label a diagram of their created flowering plant to show its parts, their role and the method of pollination and seed dispersal

- Observe seeds being blown from the trees e.g. sycamore seeds. • Research different types of seed dispersal.
- Classify seeds in a range of ways, including by how they are dispersed.
- Create a new species of flowering plant.

'Concept Cartoons' and 'Exit Cards' to be used at the end of lessons to assess understanding.

TAPS practical assessments to be used at the end of each unit.

Lower Key Stage 2 Working Scientifically

- **Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions**

They draw conclusions based on their evidence and current subject knowledge. They identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry. Children use their evidence to suggest values for different items tested using the same method e.g. the distance travelled by a car on an additional surface. Following a scientific experience, the children ask further questions which can be answered by extending the same enquiry.

Proof of Progress (Working Towards, Age Related Expectation or Greater Depth)

Identify and describe the functions of different parts of flowering plants: roots, stem, leaves and flowers.

Basic

Describe and illustrate the functions of different parts of flowering plants.

Advancing

Explain how leaves are important in creating food for a plant.

Deep

Prove or disprove that roots act like straws sucking up water for the plant.

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.

Basic

Grow, observe and record the growth of a range of different plants.

Advancing

Compare and contrast the conditions for growth for a range of different plants.

Explain why these differences may exist.

Deep

Create a planting plan for a 1 metre square bed of flowers that will look its best three years from planting.

Justify your choice of plants.

Investigate the way in which water is transported within plants.

Basic

Observe (or read about) and answer questions about how water is transported in plants.

Advancing

Experiment with food colouring to demonstrate how water is transported through a plant.

Explain the experiment and summarise your observations.

Compare and contrast your observations with those of others.

Deep

Can you change the colour of celery? Prove it and draw some scientific conclusions.

Explore the role of flowers in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.

Basic

Label the parts of a flower.

Describe the process of pollination.

List ways in which plants are pollinated.

Describe how seeds are formed.

List ways in which seeds are dispersed.

Advancing

Using a range of (real) flowering plants, locate and name the parts of a flower. (apply)

Compare different flowers and explain the differences in the size and shape of the parts of a flower.

Explain why a flower that is not pollinated will not reproduce.

Deep

Suggest reasons why some people are worried about a fall in the number of bees in the British Isles.

Why might flowering plants grow in high up rooftops or gutters even if humans did not put them there?

Animals are a flowering plant's best friend. Do you agree? (reason)

End of Lower Key Stage 2 Age Related Expectations

Milestone indicator	Basic	Advancing	Deep
Identify and describe the functions of different parts of flowering plants: roots, stem, leaves and flowers.	Describe and illustrate the functions of different parts of flowering plants.	Explain how leaves are important in creating food for a plant.	Prove or disprove that roots act like straws sucking up water for the plant.
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.	Grow, observe and record the growth of a range of different plants.	Compare and contrast the conditions for growth for a range of different plants. Explain why these differences may exist.	Create a planting plan for a 1 metre square bed of flowers that will look its best three years from planting. Justify your choice of plants.
Investigate the way in which water is transported within plants.	Observe (or read about) and answer questions about how water is transported in plants.	Experiment with food colouring to demonstrate how water is transported through a plant. Explain the experiment and summarise your observations. Compare and contrast your observations with those of others.	Can you change the colour of celery? Prove it and draw some scientific conclusions .
Explore the role of flowers in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	Label the parts of a flower. Describe the process of pollination. List ways in which plants are pollinated. Describe how seeds are formed. List ways in which seeds are dispersed.	Using a range of (real) flowering plants, locate and name the parts of the flower. (apply) Compare different flowers and explain the differences in the size and shape of the parts of the flower. Explain why a flower that is not pollinated will not reproduce.	Suggest reasons why some people are worried about a fall in the number of bees in the British Isles. Why might flowering plants grow in high up rooftops or gutters even if humans did not put them there? Animals are a flowering plant's best friend. Do you agree? (reason)

Year 4: Living things and their habitats

- 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

Notes:

Pupils should use the local environment throughout the year to raise and answer questions that help them to **identify and study plants** and animals in their habitat. They should identify how the habitat changes throughout the year. Pupils should explore possible ways of **grouping a wide selection of living things that include** animals, **flowering plants and non-flowering plants**. Pupils could begin to put vertebrate animals into groups, for example: fish, amphibians, reptiles, birds, and mammals; and invertebrates into snails and slugs, worms, spiders, and insects.

Note: plants can be grouped into categories such as flowering plants (including grasses) and non-flowering plants, for example ferns and mosses.

Pupils should explore examples of human impact (both positive and negative) on environments, for example, the positive effects of nature reserves, ecologically planned parks, or garden ponds, and the negative effects of population and development, litter or deforestation.

Pupils might work scientifically by: using and making simple guides or keys to explore and identify local plants and animals; making a guide to local living things; raising and answering questions based on their observations of animals and what they have found out about other animals that they have researched.

Key Vocabulary

Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate

Common Misconceptions

Some children may think:

- the death of one of the parts of a food chain or web has no or limited consequences on the rest of the chain
- there is always plenty of food for wild animals
- animals are only land-living creatures
- animals and plants can adapt to their habitats, however they change
- all changes to habitats are negative.

Activities

- Observe plants and animals in different habitats throughout the year.
- Compare and contrast the living things observed.
- Use classification keys to name unknown living things.
- Classify living things found in different habitats based on their features.
- Create a simple identification key based on observable features.
- Use fieldwork to explore human impact on the local environment e.g. litter, tree planting.
- Use secondary sources to find out about how environments may naturally change.
- Use secondary sources to find out about human impact, both positive and negative, on environments

Possible Evidence

- Can name living things living in a range of habitats, giving the key features that helped them to identify them
- Can give examples of how an environment may change both naturally and due to human impact
- Can keep a careful record of living things found in different habitats throughout the year (diagrams, tally charts etc.)
- Can use classification keys to identify unknown plants and animals
- Can present their learning about changes to the environment in different ways e.g. campaign video, persuasive letter

TAPS practical assessments to be used at the end of each unit.

'Concept Cartoons' and 'Exit Cards' to be used at the end of lessons to assess understanding.

Lower Key Stage 2 Working Scientifically

- **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**

The children sometimes decide how to record and present evidence. They record their observation e.g. using photographs, videos, pictures, labelled diagrams or writing. They record their measurements e.g. using tables, tally charts and bar charts (given templates, if required, to which they can add headings). They record classifications e.g. using tables, Venn diagrams, Carroll diagrams. Children are supported to present the same data in different ways in order to help with answering the question.

Proof of Progress (Working Towards, Age Related Expectation or Greater Depth)

Recognise that living things can be grouped in a variety of ways.

Basic

Name groups of animals (and plants).

Describe the features of animals (and plants) in particular groups.

Match animals (and plants) to groups.

Advancing

Compare and contrast the features of animals (and plants) in different groups.

Summarise the key similarities and differences of animals (and plants) in different groups.

Explain how you have chosen the key similarities and differences to summarise.

Deep

Are there any ways in which you could classify animals (and plants) so that they may be in more than one group? (**suggest, reason, propose, arrange**)



See an example on page 103

Explore and use classification keys.

Basic

Complete a classification key from a list of animals (and plants).

Advancing

Identify animals (and plants) using a classification key (**apply**)

Adapt a classification key to include different criteria.

Deep

Construct classification keys for animals (and plants).

See an example on page 101

Recognise that environments can change and that this can sometimes pose dangers to specific habitats.

Basic

Name and describe a range of different habitats.

Identify and label specific plants and animals in these habitats.

Describe how a change to an environment (e.g. deforestation in rainforests) is a danger to specific habitats.

Advancing

Compare changes in two or more habitats and categorise the effects of the changes.



Deep

Explain the concept of conservation and how groups are trying to preserve habitats.

See an example on page 102



End of Lower Key Stage 2 Age Related Expectations

Milestone indicator	Basic	Advancing	Deep
Recognise that living things can be grouped in a variety of ways.	<p>Name groups of animals (and plants).</p> <p>Describe the features of animals (and plants) in particular groups.</p> <p>Match animals (and plants) to groups.</p>	<p>Compare and contrast the features of animals (and plants) in different groups.</p> <p>Summarise the key similarities and differences of animals (and plants) in different groups.</p> <p>Explain why you have chosen the key similarities and differences to summarise.</p>	<p>Are there any ways in which you could classify animals (and plants) so that they may be in more than one group? (suggest, reason, propose, arrange)</p>
Explore and use classification keys.	<p>Complete a classification key from a list of animals (and plants).</p>	<p>Identify animals (and plants) using a classification key (apply).</p> <p>Adapt a classification key to include different criteria.</p>	<p>Construct classification keys for animals (and plants).</p>
Recognise that environments can change and that this can sometimes pose dangers to specific habitats.	<p>Name and describe a range of different habitats.</p> <p>Identify and label specific plants and animals in these habitats.</p> <p>Describe how (for example, deforestation in rainforests) is a danger to specific habitats.</p>	<p>Compare changes in two or more habitats and categorise the effects of the changes.</p>	<p>Explain the concept of conservation and how groups are trying to preserve habitats.</p>

Year 5: Living Things and their Habitats

- describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird
- **describe the life process of reproduction in some plants** and animals.

Notes:

Pupils should study and raise questions about their local environment throughout the year. They should observe life-cycle changes in a variety of living things, for example, **plants in the vegetable garden or flower border**, and animals in the local environment. They should find out about the work of naturalists and animal behaviourists, for example, David Attenborough and Jane Goodall.

Pupils should find out about different types of reproduction, including sexual and asexual **reproduction in plants**, and sexual reproduction in animals.

Pupils might work scientifically by: observing and comparing the life cycles of plants and animals in their local environment with other plants and animals around the world (in the rainforest, in the oceans, in desert areas and in prehistoric times), asking pertinent questions and suggesting reasons for similarities and differences. **They might try to grow new plants from different parts of the parent plant, for example, seeds, stem and root cuttings, tubers, bulbs.** They might observe changes in an animal over a period of time (for example, by hatching and rearing chicks), comparing how different animals reproduce and grow.

Key Vocabulary

Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, bulbs, cuttings

Common Misconceptions

Some children may think:

- all plants start out as seeds • all plants have flowers
- plants that grow from bulbs do not have seeds
- only birds lay eggs.
-

Activities

- Use secondary sources and, where possible, first-hand observations to find out about the life cycle of a range of animals.
- Compare the gestation times for mammals and look for patterns e.g. in relation to size of animal or length of dependency after birth.
- Look for patterns between the size of an animal and its expected life span.
- Grow and observe plants that reproduce asexually e.g. strawberries, spider plants, potatoes.
- Take cuttings from a range of plants e.g. African violet, mint.
- Plant bulbs and then harvest to see how they multiply. • Use secondary sources to find out about pollination.

Possible Evidence

- Can draw the life cycle of a range of animals identifying similarities and differences between the life cycles
- Can explain the difference between sexual and asexual reproduction and give examples of how plants reproduce in both ways
- Can present their understanding of the life cycle of a range of animals in different ways e.g. drama, pictorially, chronological reports, creating a game • Can identify patterns in life cycles • Can compare two or more animal life cycles they have studied • Can explain how a range of plants reproduce asexually

'Concept Cartoons' and 'Exit Cards' to be used at the end of lessons to assess understanding.

TAPS practical assessments to be used at the end of each unit.

Proof of Progress (Working Towards, Age Related Expectation or Greater Depth)

Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.

Basic

Draw and describe the life cycle of a mammal.

Draw and describe the life cycle of an amphibian.

Draw and describe the life cycle of an insect.

Draw and describe the life cycle of a bird.

Advancing

Explain the similarities and differences in the life cycles of a mammal, an amphibian, an insect and a bird.

Deep

True or false? All young offspring look like smaller versions of their adult parents.

Always, sometimes or never? Eggs are common to the life cycles of mammals, amphibians, insects and birds.



See an example on page 206

Describe the life process of reproduction in some plants and animals.

Basic

Draw and describe the process of reproduction in some plants.

Draw and describe the process of reproduction in some animals.



Advancing

Explain the similarities and differences between the process of reproduction in plants and animals.



Deep

Relate the reproduction of plants to your knowledge of the life cycle of insects.

Relate the reproduction of some animals and plants to your knowledge of food chains.



See an example on page 206

Describe how living things are classified into broad groups according to common observable characteristics.

Basic

Look at and copy classification keys for common insects.

Use classification keys to identify insects and animals.

Make classification keys.

Advancing

Identify plants, mammals, amphibians, insects and birds from classification keys.

Explain why observable features are used to classify living things into broad groups.



Deep

Propose criteria for the creation of classification groups for:

- mammals
- amphibians
- insects
- birds.

Present information about and reasons for these groups.

See an example on page 206

Year 6: Living Things and their Habitats

- describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, **including micro-organisms, plants and animals**
- give reasons for classifying plants and animals based on specific characteristics

Notes:

Pupils should build on their learning about grouping living things in year 4 by looking at the classification system in more detail. They should be introduced to the idea that **broad groupings, such as micro-organisms, plants** and animals can be subdivided. Through direct observations where possible, they should classify animals into commonly found invertebrates (such as insects, spiders, snails, worms) and vertebrates (fish, amphibians, reptiles, birds and mammals). They should discuss reasons why living things are placed in one group and not another. Pupils might find out about the significance of the work of scientists such **as Carl Linnaeus, a pioneer of classification** → *Link to Writing piece.*

Pupils might work scientifically by: using classification systems and keys to identify some animals and plants in the immediate environment. They could research unfamiliar animals and plants from a broad range of other habitats and decide where they belong in the classification system.

Key Vocabulary

Vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, insects, spiders, snails, worms, flowering , non-flowering

Common Misconceptions

- Some children may think:
- all micro-organisms are harmful
 - mushrooms are plants.

Activities

- Use secondary sources to learn about the formal classification system devised by Carl Linnaeus and why it is important.
- Use first-hand observation to identify characteristics shared by the animals in a group.
- Use secondary sources to research the characteristics of animals that belong to a group.
- Use information about the characteristics of an unknown animal or plant to assign it to a group.
- Classify plants and animals, presenting this in a range of ways e.g. Venn diagrams, Carroll diagrams and keys.
- Create an imaginary animal which has features from one or more groups.

TAPS practical assessments to be used at the end of each unit.

Possible Evidence

- Can give examples of animals in the five vertebrate groups and some of the invertebrate groups
- Can give the key characteristics of the five vertebrate groups and some invertebrate groups
- Can compare the characteristics of animals in different groups
- Can give examples of flowering and non-flowering plants
- Can use classification materials to identify unknown plants and animals
- Can create classification keys for plants and animals
- Can give a number of characteristics that explain why an animal belongs to a particular group

'Concept Cartoons' and 'Exit Cards' to be used at the end of lessons to assess understanding.

Upper Key Stage 2 Working Scientifically

- Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs**

The children decide how to record and present evidence. They record observations e.g. using annotated photographs, videos, labelled diagrams, observational drawings, labelled scientific diagrams or writing. They record measurements e.g. using tables, tally charts, bar charts, line graphs and scatter graphs. They record classifications e.g. using tables, Venn diagrams, Carroll diagrams and **classification keys**. Children present the same data in different ways in order to help with answering the question.

Proof of Progress (Working Towards, Age Related Expectation or Greater Depth)

Describe the life process of reproduction in some plants and animals.

Basic

Draw and describe the process of reproduction in some plants.

Draw and describe the process of reproduction in some animals.



Advancing

Explain the similarities and differences between the process of reproduction in plants and animals.



Deep

Relate the reproduction of plants to your knowledge of the life cycle of insects.

Relate the reproduction of some animals and plants to your knowledge of food chains.



See an example on page 218

Describe how living things are classified into broad groups according to common observable characteristics.

Basic

Look at and copy classification keys for common insects.

Use classification keys to identify insects and animals.

Make classification keys.

Advancing

Identify plants, mammals, amphibians, insects and birds from classification keys.

Explain why observable features are used to classify living things into broad groups.



Deep

Propose criteria for the creation of classification groups for:

- mammals
- amphibians
- insects
- birds.

Present information about and reasons for these groups.

See an example on page 219

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

Basic

Recognise and name the characteristics used in classification groups for plants and animals.

List reasons why these characteristics are used.

Advancing

Explain some of the problems with not using specific characteristics when classifying living things.



Deep

Observable characteristics are not the only way to scientifically group plants and animals. **Do you agree?**

See an example on page 220

End of Upper Key Stage 2 Age Related Expectations

Milestone indicator	Basic	Advancing	Deep
Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.	<p>Draw and Describe the life cycle of a mammal.</p> <p>Draw and Describe the life cycle of an amphibian.</p> <p>Draw and Describe the life cycle of an insect.</p> <p>Draw and Describe the life cycle of a bird.</p>	<p>Explain the similarities and differences in the life cycles of a mammal, an amphibian, an insect and a bird.</p>	<p>True or false: all young offspring look like smaller versions of their adult parents?</p> <p>Always, sometimes or never: eggs are common to the life cycles of mammals, amphibians, insects and birds?</p>
Describe the life process of reproduction in some plants and animals.	<p>Draw and describe the process of reproduction in some plants.</p> <p>Draw and describe the process of reproduction in some animals.</p>	<p>Explain the similarities and differences between the process of reproduction in plants and animals.</p>	<p>Relate the reproduction of plants to your knowledge of the life cycle of insects.</p> <p>Relate the reproduction of some animals and plants to your knowledge of food chains.</p>
Describe how living things are classified into broad groups according to common observable characteristics.	<p>Look at and copy classification keys for common insects.</p> <p>Use classification keys to identify insects and animals.</p> <p>Make classification keys.</p>	<p>Identify plants, mammals, amphibians, insects and birds from classification keys.</p> <p>Explain why observable features are used to classify living things into broad groups.</p>	<p>Propose criteria for the creation of classification groups for either:</p> <ul style="list-style-type: none"> • mammals • amphibians • insects • birds. <p>Present information about and reasons for these groups.</p>
Give reasons for classifying plants and animals based on specific characteristics.	<p>Recognise and name the characteristics used in classification groups for plants and animals.</p> <p>List reasons why these characteristics are used.</p>	<p>Explain some of the problems with not using specific characteristics when classifying living things.</p>	<p>Do you agree: observable characteristics are not the only way to scientifically group plants and animals?</p>

Year 6: Evolution and Inheritance

- 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.**

Notes:

Building on what they learned about fossils in the topic on rocks in year 3, pupils should find out more about how living things on earth have changed over time. They should be introduced to the idea that characteristics are passed from parents to their offspring, for instance by considering different breeds of dogs, and what happens when, for example, Labradors are crossed with poodles. They should also appreciate that variation in offspring over time can make animals more or less able to survive in particular environments, for example, by exploring how giraffes' necks got longer, or the development of insulating fur on the arctic fox. Pupils might find out about the work of palaeontologists such as Mary Anning and about how Charles Darwin and Alfred Wallace developed their ideas on evolution.

Note: at this stage, pupils are not expected to understand how genes and chromosomes work.

Pupils might work scientifically by: observing and raising questions about local animals and how they are adapted to their environment; comparing how some living things are adapted to survive in extreme conditions, for example, cactuses, penguins and camels. They might analyse the advantages and disadvantages of specific adaptations, such as being on 2 feet rather than 4, having a long or a short beak, having gills or lungs, **tendrils on climbing plants, brightly coloured and scented flowers.**

Key Vocabulary

Offspring, sexual reproduction, vary, characteristics, suited, adapted, environment, inherited, species, fossil

Common Misconceptions

Some children may think:

- adaptation occurs during an animal's lifetime: giraffes' necks stretch during their lifetime to reach higher leaves and animals living in cold environments grow thick fur during their life
- offspring most resemble their parents of the same sex, so that sons look like fathers
- all characteristics, including those that are due to actions during the parent's life such as dyed hair or footballing skills, can be inherited
- cavemen and dinosaurs were alive at the same time.
-

Activities

- Design a new plant or animal to live in a particular habitat.
- Use models to demonstrate evolution e.g. 'Darwin's finches' bird beak activity.
- Use secondary sources to find out about how the population of peppered moths changed during the industrial revolution.
- Make observations of fossils to identify living things that lived on Earth millions of years ago.

Possible Evidence

- Can explain the process of evolution
- Can give examples of how plants and animals are suited to an environment
- Can give examples of how an animal or plant has evolved over time e.g. penguin, peppered moth
- Give examples of living things that lived millions of years ago and the fossil evidence we have to support this
- Can give examples of fossil evidence that can be used to support the theory of evolution

- Identify features in animals and plants that are passed on to offspring and explore this process by considering the artificial breeding of animals or plants e.g. dogs.
- Compare the ideas of Charles Darwin and Alfred Wallace on evolution.
- Research the work of Mary Anning and how this provided evidence of evolution.

- Can identify characteristics that will make a plant or animal suited or not suited to a particular habitat
- Can link the patterns seen in the model to real examples
- Can explain why the dominant colour of the peppered moth changed over a very short period of time

Concept Cartoons' and 'Exit Cards' to be used at the end of lessons to assess understanding.







TAPS practical assessments to be used at the end of each unit.

Upper Key Stage 2 Working Scientifically

- **Identifying scientific evidence that has been used to support or refute ideas or arguments**

Children answer their own and others' questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. When doing this, they discuss whether other evidence e.g. from other groups, secondary sources and their scientific understanding, supports or refutes their answer. They talk about how their scientific ideas change due to new evidence that they have gathered. They talk about how new discoveries change scientific understanding.

Proof of Progress (Working Towards, Age Related Expectation or Greater Depth)

<p>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.</p> <p><small>Note: this standard also appears in Milestone 2 and the tasks here are replicated.</small></p> <table border="1"> <thead> <tr> <th>Basic</th> <th>Advancing</th> <th>Deep</th> </tr> </thead> <tbody> <tr> <td>Name a variety of animal and plant fossils.</td> <td>Categorise fossils in a number of ways.</td> <td>Investigate the conditions in which life on Earth survived millions of years ago. <small>See an example of page 22</small></td> </tr> <tr> <td>Describe the conditions in which the fossils once lived.</td> <td>Compare and contrast different fossils.</td> <td>Burning fossil fuels is widely thought by scientists to contribute to a rise in worldwide temperature. Investigate this and cite evidence that supports or questions this view.</td> </tr> <tr> <td>Note, name and describe plants and animals that inhabited the Earth millions of years ago.</td> <td>Explain the process of the formation of fossils.</td> <td></td> </tr> </tbody> </table>	Basic	Advancing	Deep	Name a variety of animal and plant fossils.	Categorise fossils in a number of ways.	Investigate the conditions in which life on Earth survived millions of years ago. <small>See an example of page 22</small>	Describe the conditions in which the fossils once lived.	Compare and contrast different fossils.	Burning fossil fuels is widely thought by scientists to contribute to a rise in worldwide temperature. Investigate this and cite evidence that supports or questions this view.	Note, name and describe plants and animals that inhabited the Earth millions of years ago.	Explain the process of the formation of fossils.		<p>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.</p> <table border="1"> <thead> <tr> <th>Basic</th> <th>Advancing</th> <th>Deep</th> </tr> </thead> <tbody> <tr> <td>Observe and describe differences between living things and their offspring.</td> <td>Categorise differences in living things and their offspring.</td> <td>Is it possible that a litter of cocker spaniel puppies from two parents of the same colour may vary in colour? <small>See an example of page 23</small></td> </tr> <tr> <td>Observe and name offspring that are not identical to their parents and describe how they vary.</td> <td>Explain, with examples, how offspring are not identical.</td> <td></td> </tr> </tbody> </table>	Basic	Advancing	Deep	Observe and describe differences between living things and their offspring.	Categorise differences in living things and their offspring.	Is it possible that a litter of cocker spaniel puppies from two parents of the same colour may vary in colour? <small>See an example of page 23</small>	Observe and name offspring that are not identical to their parents and describe how they vary.	Explain, with examples, how offspring are not identical.		<p>Identify how animals and plants are adapted to suit their environment in different ways and how that adaptation may lead to evolution.</p> <table border="1"> <thead> <tr> <th>Basic</th> <th>Advancing</th> <th>Deep</th> </tr> </thead> <tbody> <tr> <td>Match a range of animals and plants to the environments in which they are found.</td> <td>Explain and give examples of the idea of adaptation.</td> <td>True or false? Plants and animals would not survive if they could not adapt. <small>See an example of page 24</small></td> </tr> <tr> <td>Describe how animals and plants are suited to the environments in which they are found.</td> <td>Compare and contrast different types of adaptation.</td> <td>Which do you think are the best examples of an animal and a plant that show adaptation? (suggest)</td> </tr> <tr> <td>Illustrate how animals and plants adapt to environments in different ways.</td> <td>Explain why adaptation may lead to evolution.</td> <td>Evolution is the only way a species can survive. Do you agree?</td> </tr> <tr> <td>Describe the theory of evolution.</td> <td></td> <td></td> </tr> </tbody> </table>	Basic	Advancing	Deep	Match a range of animals and plants to the environments in which they are found.	Explain and give examples of the idea of adaptation.	True or false? Plants and animals would not survive if they could not adapt. <small>See an example of page 24</small>	Describe how animals and plants are suited to the environments in which they are found.	Compare and contrast different types of adaptation.	Which do you think are the best examples of an animal and a plant that show adaptation? (suggest)	Illustrate how animals and plants adapt to environments in different ways.	Explain why adaptation may lead to evolution.	Evolution is the only way a species can survive. Do you agree?	Describe the theory of evolution.		
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End of Upper Key Stage 2 Age Related Expectations

Milestone indicator	Basic	Advancing	Deep
<p>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. * Note - this indicator also appears in Milestone 2 and the tasks here are replicated.</p>	<p>Name a variety of animal and plant fossils.</p> <p>Describe the conditions in which the fossils once lived.</p> <p>Note, name and describe plants and animals that inhabited the Earth millions of years ago.</p>	<p>Categorise fossils in a number of ways.</p> <p>Compare and contrast different fossils.</p> <p>Explain the process of the formation of fossils.</p>	<p>Investigate the conditions in which life on Earth survived millions of years ago.</p> <p>Burning fossil fuels is widely thought by scientists to contribute to a rise in worldwide temperature. Investigate this and cite evidence that supports or questions this view.</p>
<p>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.</p>	<p>Observe and describe differences between living things and their offspring.</p> <p>Observe and name offspring that are not identical to their parents and describe how they vary.</p>	<p>Categorise differences in living things and their offspring.</p> <p>Explain, with examples, how offspring are not identical.</p>	<p>Is it possible that a litter of cocker spaniel puppies from two parents of the same colour may vary in colour?</p>
<p>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. * Note - a similar indicator also appears in Milestone 2 but excludes the last part - 'and that adaptation may lead to evolution'. The tasks here are replicated with some additional tasks about evolution.</p>	<p>Match a range of animals and plants to the environments in which they are found.</p> <p>Describe how animals and plants are suited to the environments in which they are found.</p> <p>Illustrate how animals and plants adapt to environments in different ways.</p> <p>Describe the theory of evolution.</p>	<p>Explain and give examples of the idea of adaptation.</p> <p>Compare and contrast different types of adaptation.</p> <p>Explain why adaptation may lead to evolution.</p>	<p>True or false: plants and animals would not survive if they could not adapt?</p> <p>Which do you think are the best examples (suggest) of an animal and plant that shows adaptation ?</p> <p>Do you agree: evolution is the only way a species can survive?</p>