

Waterville Primary School Progression of Skills and Vocabulary in Science – Living things and their habitats

Year 2

KS1 National Curriculum

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 'micro-habitat' (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 for example: '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 (e.g. grass, cow, human). They could describe the conditions in different habitats and micro-habitats (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.

Pupils should be taught:

- 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

Prior Learning

In Early Years:

- Comments and questions about the place they live or the natural world.
- Shows care and concern for living things and the environment.
- Can talk about things they have observed such as plants and animals.
- Notices features of objects in their environment. Comments and asks questions about their familiar world

Vocabulary:

Living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed, names of local habitats e.g. pond, woodland etc., names of micro-habitats e.g. under logs, in bushes etc.

Key skills to be taught	Key Ideas	Possible Activities
<p>To ask simple questions and recognise that they can be answered in different ways.</p> <p>To observe closely, using simple equipment.</p> <p>To perform simple tests.</p> <p>To identify and classify.</p> <p>To use their observations and ideas to suggest answers to questions.</p> <p>To gather and record data to help in answering questions.</p>	What make something living?	<ul style="list-style-type: none"> • Develop a basic understanding of 7 life processes using activities. Always link humans-animals plants. • Movement – video dancing/sport; Introduce muscles/bones; Show animals moving; Leaf movement; etc • Respiration (breathing) – run on spot (count breathing/pulse rate) • Sensitivity – Senses games/quiz; recall 5 senses; Animals senses (woodlice); Cress bend to light • Growth – Order growth stages cards (humans, animals, plants) • Reproduction – Link adults to babies (PowerPoint); trip to zoo to see baby animals; look at flowers/seeds • Excretion – Drinking water experiment – link to number of times pupils go to the toilet over a day (tally) • Nutrition – 'Good' food/'bad' food (why?); Carnivores/herbivores; fertiliser experiments on grass Use laminated word cards to build important vocabulary. Support recall.
	Can you identify living, dead & non-living things?	<ul style="list-style-type: none"> • Sort pictures / clips into living, dead, non-living using assumptions (include robots, lichens, etc). Develop features of living (MRS GREN). Label worksheet. Create display / poster • Develop definitions for living, dead & non-living • Walk around school grounds identifying living, dead & non-living. Emphasise recall of words. • Take photos. Group and label. • Design a spacesuit. Design an alien.
	What is a habitat?	<ul style="list-style-type: none"> • Identify different areas of school grounds to study. Discuss habitat features. Measure using equipment / over time with data loggers. • Link features with living requirements. Compare to desert, rainforest, ocean, beach, etc • Introduce concept of microhabitat. Habitats provide for the basic needs of the animal or plant. Collage microhabitats for given animals. Explain adaptations using science words. • Model the use of number lines to sample an area using a quadrat. Pupils use the technique in the classroom using model/picture animals. Record and compare different habitats.
	How are living things suited to their own habitat?	<ul style="list-style-type: none"> • Collect animals / plants in habitats. Is there a difference? Explore microhabitats. Classify using keys. Suggests ways they are suited. Wall display of school grounds with pictures of animals. Design tank habitat to keep woodlice. • Fair test - Use marked clear tubes as choice-chambers to explore different preference for woodlice. • Use DVD clips to show animals in other habitats. Show how they are suited. Label features.
	What is a food chain?	<ul style="list-style-type: none"> • What did you eat for dinner? Start to link in a chain. • Use examples to create food chains. Record as large paper chains with pictures stuck on. Link back to collected specimens. • Research / use prepared cards (food chain games) to find out who eats who. Create food chains. Play tag to make a complete chain.

Next steps in Year 4:

- 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.

Waterville Primary School Progression of Skills and Vocabulary in Science – Living things and their habitats

Year 4

KS1 National Curriculum

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 and flowering plants and non-flowering plants. Pupils could begin to put vertebrate animals into groups such as fish, amphibians, reptiles, birds, and mammals; and invertebrates into snails and slugs, worms, spiders, and insects. 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.

Pupils should be taught:

- 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.

Prior Learning

In Year 2:

- 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

Vocabulary:

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

Key skills to be taught	Key Ideas	Possible Activities
asking relevant questions and using different types of scientific enquiries to answer them	Can you group living things in different ways?	<ul style="list-style-type: none"> • Play animal 'lotto' game. Group / refine. • Review vertebrate animal groups (fish, amphibians, reptiles, birds, mammals). Identify features (fine differences). Discuss bat, bird & flying insect – why are they not in the same group? • Plastic animal models. Group / regroup. Discuss • Use / construct spider keys to classify (fine differences)
setting up simple practical enquiries, comparative and fair tests	Can you use a classification key?	<ul style="list-style-type: none"> • Create animal/plant identification sheets (photo; main features for classification; research information). This should reflect animals/plants to be found in habitats below. Build portfolio over the years. • Identify invertebrates on a specimen tray with a key. Use magnifying lenses for fine features. Identify tree leaves by a key. Explore trees outside to name (in Autumn use fallen leaves under a tree) • Identify pictures of common plants including grasses by a key
gathering, recording, classifying and presenting data in a variety of ways to help in answering questions	What living things can we find in ... habitat?	<ul style="list-style-type: none"> • Use list to collect internet pictures & research information. Wall display / folder of animals & plants in the habitat. • Compare different habitats. • Ask 'what would happen if we changed the habitat?' (e.g. cut grass, overgrown pond, rubbish, etc). Predict with data. • Explore local habitat. Identify animals & plants using keys & species lists. Create a 'biodiversity' list or use a simple bug hunt. • Use pit-fall traps to capture invertebrates in different habitats. Compare. • Explore habitats over time. Tally/chart species & number counts. • Compare habitats. Use number lines (tape measure) to sample an area with a quadrat. Collect data. Compare habitats.
recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	Recognise habitats can change	<ul style="list-style-type: none"> • Watch DVD information. Research using the internet. Interview wildlife expert. Explore data. • 'Reading images'. Explore a provocative image (e.g. hunting, forest fire, fly-tipping, oil spill, etc). Change the habitat for woodlice/snail vivarium. • Visit local habitat under threat or change (e.g. SSSI, dunes, wetland, moorland, greenbelt, patch of green in the city, etc). Get involved in conservation • Develop wildlife area around school. Monitor physical/ species changes over time
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.		

Next steps in Year 5:

- 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.

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Year 5	<p>KS2 National Curriculum</p> <p>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.</p> <p>Pupils should be taught:</p> <ul style="list-style-type: none"> 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.
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Prior Learning	<p>In Year 4:</p> <ul style="list-style-type: none"> 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 danger to living things 	<p>Vocabulary:</p> <p>Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, bulbs, cuttings</p>
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Key skills to be taught	Key Ideas	Possible Activities
<p>asking relevant questions and using different types of scientific enquiries to answer them</p> <p>setting up simple practical enquiries, comparative and fair tests</p>	Compare animal Life cycles	<ul style="list-style-type: none"> Use picture cards to order life cycles of insect (butterfly, locust), amphibian (frog), bird (chicken, duck) & mammal (mouse, dog, human, etc). Compare to see similarities & differences. Generate annotated life cycles. Research. Compare to human. Link life cycles to food needs / habitats. Build terminology. Set up & maintain living examples of key animal groups (e.g. locusts, hissing cockroach, giant land snails, worms (wormery), fish, frogs/toads, corn snake, chickens/ducks, mice, rat, gerbil, etc). Maintain using science clubs. Develop fair tests to monitor behaviour. Create photo timelines of changes from birth to adulthood in different animal examples. Visit arable farm throughout year to observe crop plants growing. Time-lapse photography
<p>gathering, recording, classifying and presenting data in a variety of ways to help in answering questions</p> <p>recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</p>	Reproduction in plants	<ul style="list-style-type: none"> Review plant life cycle. Annotate diagrams. Emphasise pollen & eggs are gametes (link to animal/human reproduction). Include the word fertilization. Asexual reproduction to include runners, bulbs, etc. Flower dissection. Label/annotate. Use sticky-plastic to stick into books. Make a flower using materials. Label & annotate it. Collect pollen on cello tape from different plants. Stick into books and label. Use magnifying glass to view. Compare/contrast – link to pollination type
<p>using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</p> <p>identifying differences, similarities or changes related to simple scientific ideas and processes</p> <p>using straightforward scientific evidence to answer questions or to support their findings.</p>	Reproduction in plants	<ul style="list-style-type: none"> Review (describe/explain) events in plant reproduction (model) Fair test: Does wind speed effect how far pollen is blown? Flour blown by fan at different speeds. Measure distance spread. Vary types of flour for weight. Survey: Do certain insects prefer certain plants? Count insect visitors to different plants over half hr. Investigate: How do seeds stick to animals for dispersal? Use different materials (cotton wool, Velcro, glue on paper, etc) to stick to cloth. Shake test to see which sticks the best. Link to real seeds. Fair test: How does the weight/propeller size effect Sycamore seed dispersal? Sycamore seeds / manufactured seeds using card and blu-tac. Drop seeds. Measure distance spread from central point.

<p>Next steps in Year 6:</p> <ul style="list-style-type: none"> 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
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Year 6

KS2 National Curriculum

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. 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

Pupils should be taught:

- 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

Prior Learning

In Year 5:

- 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

Vocabulary:

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

Key skills to be taught	Key Ideas	Possible Activities
asking relevant questions and using different types of scientific enquiries to answer them	How are animals & plants classified?	<ul style="list-style-type: none"> • Review living, dead, non-living (MRS GREN) • Classification of animal/plant kingdom. Provide characteristics. Place picture cards (with information) into correct group. • Create classification display. Create picture & information collage in books of examples of major groups. • Research work of John Ray & Carl Linnaeus. Describes classification system & binomial naming system (could describe 5 kingdom classification system) • Create vivarium/outdoor habitats. Keep examples of groups or encourage animals into a dedicated area through food/shelter. • Webcam bird feeder. Monitor, classify & tabulate • Make labelled models of plants/animals from observation. Cover e.g. from main groups
setting up simple practical enquiries, comparative and fair tests	What types of living things are there in ...?	<ul style="list-style-type: none"> • Create species diversity list for a specific habitat. Photographs and descriptions used. • Draw annotated diagrams of collected plants/animals (describe important classification features). Collect animals/plants from the local environment. Sort into broad groups or named organism using spider/number keys. Could use preserved specimens or pictures. • Use a quadrat/transect to sample an area. Identify plant species. Photograph. Tabulate & chart
gathering, recording, classifying and presenting data in a variety of ways to help in answering questions	Can you make a key to classify?	<ul style="list-style-type: none"> • Create spider/number key for pupils. Play 'Guess Who?' • Create large (classroom/playground) number key where the next step is given as clues to hidden locations. Can use animals, plants or collected pupil information • Use plastic/preserved animals, tree leaves or pictures to create spider & number keys. Model process for pupils.
recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	Where can we find microbes?	<ul style="list-style-type: none"> • Look at images of bacteria, fungi, protocista & viruses (microscopic). Reasons for grouping. • Fungi hunt: explore wooded area. Take photos of fungi. Link to habitat conditions. Name using classification books. Create wall display showing map of area and species found. • Draw precise diagrams of final samples. Label as bacteria or fungi (name if possible) • Fair test: Where do microbes grow? Collect microbe samples using cotton buds from different parts of classroom / body. Grow on SEALED Petri-dishes (nutrient agar). Examine. Compare • Fair test: Which conditions are best for mold to grow? Allow slices of bread to stand in clear open zip-lock bags in different areas for one day. SEAL and incubate in warm place for 1/2 weeks. Comparative test but could use measured variables
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.		

Next steps in KS3:

- Reproduction in humans (as an example of a mammal), including the structure and function of the male and female reproductive systems, menstrual cycle (without details of hormones), gametes, fertilisation, gestation and birth, to include the effect of maternal lifestyle on the foetus through the placenta.
- Reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, including quantitative investigation of some dispersal mechanisms.
- Differences between species.