



Tower View Primary School Science Curriculum

Animals, including Humans



Tower View Primary School Science Curriculum

Year 1 Animals, including Humans

National Curriculum Learning Objectives	<ul style="list-style-type: none"> Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals Identify and name a variety of common animals that are carnivores, herbivores and omnivores Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense 	
Prior learning	Future learning <ul style="list-style-type: none"> 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. (Y2 - 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 microorganisms, plants and animals. (Y6 - Living things and their habitats) Give reasons for classifying plants and animals based on specific characteristics. (Y6 - Living things and their habitats) 	
Key learning <ul style="list-style-type: none"> We are human Humans are a type of animal The 5 senses are: smell, touch, sight, hearing and taste Name the body parts linked to senses Identify different body parts: head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth) <p>Animals look different: Structure: wings, tails, ears, legs, fins, etc. Skin coverings: scales, feathers, hair, fur, etc.</p> <p>Different animals eat different things:</p> <ul style="list-style-type: none"> Some animals eat other animals 	Possible experiences <ul style="list-style-type: none"> Name a variety of common animals, including house hold pets. Learning the body parts through songs, actions, games, rhymes Observing and comparing themselves and those around them in photos, mirrors Explore the senses in a range of ways - link to FS with barefoot walk Sorting animals in different ways, e.g. by number of legs, fur/hair, diet, etc. Local visit to a pet store/farm/vet Compare two animals from the same or different groups 	Vocabulary head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves, names of animals experienced first-hand from each vertebrate group, parts of the human body including those within the RSE policy, senses, touch, see, smell, taste,

<ul style="list-style-type: none"> • Some animals eat plants • Some animals eat plants and animals <p>The children need to be able to name and identify a range of animals in each group e.g. name specific birds and fish. They do not need to use the terms mammal, reptiles etc. or know the key characteristics of each, although they will probably be able to identify birds and fish, based on their characteristics. The children also do not need to use the words carnivore, herbivore and omnivore.</p>	<ul style="list-style-type: none"> • Identify animals by matching the names to the images 	<p>hear, fingers, skin, eyes, nose, ears, tongue</p>
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Possible Enquiry Coverage	
Classifying	<ul style="list-style-type: none"> • Classify animals they have seen/have first-hand experience of, choosing their own criteria to do so • Classifying animals based on physical structure • Classify animals they have first-hand experience of based on what they eat (plants, other animals, both)
Observing over time	<ul style="list-style-type: none"> • Observe animals in the local environment throughout the year
Pattern seeking	<p>Children generate questions for investigations such as:</p> <ul style="list-style-type: none"> • Do people with longer arms have longer legs? • Can more people identify prawn cocktail crisps than cheese and onion? • Do all animals with... have...?
Comparative/fair testing	<ul style="list-style-type: none"> • Can I taste the difference between different flavoured crisps/skittles/smarties?
Researching	<ul style="list-style-type: none"> • Use secondary sources to name animals seen in the local environment that they may not currently be able to name (e.g. birds: magpie, blackbird) • Research what animals they have first-hand experience of eat

Scientists across the curriculum	<p>Leonardo Da Vinci – Anatomical drawing, ‘Vitruvian Man’</p> <p>Miller Hutchinson – Engineer who invented the first electric hearing aid</p> <p>Joan Beauchamp Procter – Herpetologist and Curator of Reptiles, London Zoo</p> <p>Patricia Bath – Ophthalmologist and inventor of using lasers in cataract operations</p> <p>Tanisha Allen – Zoologist who studies badgers</p> <p>George Mottershead – founded Chester Zoo in 1931. At that time, animals didn’t live in cages. They were in larger enclosures.</p>
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Tower View Primary School Science Curriculum

Year 2 Animals, including Humans

National Curriculum Learning Objectives	<ul style="list-style-type: none"> • 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	Future learning	
<ul style="list-style-type: none"> • 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) 	<ul style="list-style-type: none"> • 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. (Y2 - Living things and their habitats) • 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) 	
Key learning	Possible experiences	Vocabulary
<p>To keep ourselves healthy, we need to give our bodies what they need:</p> <ul style="list-style-type: none"> • Humans need water to drink • Humans need to eat food for energy • Exercise supports the growth of muscle and bones • Humans need good hygiene to keep themselves from getting poorly, e.g. Brushing our teeth, wash hands, regular showers/bath <p>Know the different food groups and examples of foods in the groups:</p> <ul style="list-style-type: none"> • Fruit and vegetables • Proteins • Carbohydrates • Dairy and fats 	<ul style="list-style-type: none"> • First hand experiences of observing different stages of lifecycles (frog, chicken, butterfly) • Ask people questions and use secondary sources to find out about life cycles (invite visitors in) • 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 simple effects of exercise on their bodies • Classify food in simple ways using the Eatwell Guide 	offspring, reproduction, growth, baby, toddler, child, teenager, adult, old person, names of animals and their babies (e.g. chick/chicken, kitten/cat, caterpillar/butterfly), survive, survival, water, food, air, exercise, heartbeat, breathing, hygiene, germs, disease, food types (e.g. meat,

<ul style="list-style-type: none"> • Sugar • All animals (including humans) need water, food and air to survive • All living things reproduce and have offspring • Reproduction is where living things make a new living thing that will grow and change • Offspring are the young of a living thing • Some animals give birth to live young • Some animals have offspring that don't look like them when they are young, e.g. frogs • I know that all living things grow, change and die • Human: baby, toddler, child, teenager, adult • Frog: frogspawn, tadpole, froglet, frog • Chicken: egg, chick, chicken • Butterfly: caterpillar, pupa, butterfly 	<ul style="list-style-type: none"> • Investigate washing hands or brushing teeth • Match pictures of adult animals to young animals 	<p>fish, vegetables, bread, rice, pasta, dairy)</p>
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Possible Enquiry Coverage

Classifying	<ul style="list-style-type: none"> • Based on the children's own criteria: classify seeds, classify bulbs.
Observing over time	<ul style="list-style-type: none"> • Plant seeds and bulbs and observe how they grow.
Pattern seeking	<ul style="list-style-type: none"> • Children generate questions for investigation such as: Do big seeds germinate more quickly? Does it matter which way round you plant a bulb or seed? Which comes first, the root or the shoot?
Comparative/fair testing	
Researching	<ul style="list-style-type: none"> • Look at packets to decide how to plant and care for seeds e.g. How much water do they need? Do they need shade/full sun?

Scientists across the curriculum	<p>Florence Nightingale (Nurse and founder of modern nursing) Elizabeth Garrett Anderson (First English woman to qualify as a doctor) Dr Kelly Blacklock (Veterinary Surgeon) Daniella Dos Santos (Veterinary Surgeon) Louis Pasteur (Discovered that germs are living things that can be spread by touch or through the air)</p>
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Tower View Primary School Science Curriculum

Year 3 Animals, including Humans

National Curriculum Learning Objectives	<ul style="list-style-type: none"> 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 Identify that humans and some other animals have skeletons and muscles for support, protection and movement. 	
Prior learning	Future learning	
<ul style="list-style-type: none"> 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) Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). (Y2 - Animals, including humans) Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. (Y2 - Animals, including humans) 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. (Y2 - Living things and their habitats) 	<ul style="list-style-type: none"> Describe the simple functions of the basic parts of the digestive system in humans. (Y4 - Animals, including humans) Identify the different types of teeth in humans and their simple functions. (Y4 - Animals, including humans) Construct and interpret a variety of food chains, identifying producers, predators and prey. (Y4 - Animals, including humans) Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. (Y6 - Animals, including humans) Give reasons for classifying plants and animals based on specific characteristics (Y6 – Living things and their habitats) 	
Key learning	Possible experiences	Vocabulary

<p>We eat different food groups because they do different things for our body:</p> <ul style="list-style-type: none"> • Carbohydrates, fats and sugars give us energy • Protein helps growth and repair • Fruit and vegetables give us vitamins and minerals to keep us healthy • Fibre helps us digest food that we have eaten • Water moves nutrients around our body and helps get rid of waste • A piece of food will often provide a range of nutrients <p>All living things need nutrients:</p> <ul style="list-style-type: none"> • Animals get their nutrients from food • Plants make their own food and get nutrients from soil <p>Skeletons and muscles:</p> <ul style="list-style-type: none"> • Skeletons and muscles protect organs, allow movement and support the body • Name some of the bones in a human body and what they are for: the rib cage is to protect vital organs, the spine is to support the body • Joints allow the body to move • Not all animals have a skeleton but they can still move and have other features that provide protection 	<ul style="list-style-type: none"> • Classify food in a range of ways. • Use food labels to explore the nutritional content of a range of food items. • Use secondary sources to find out the types of food that contain the different nutrients. • Use food labels to answer enquiry questions e.g. How much fat do different types of pizza contain? How much sugar is in soft drinks? • Plan a daily diet to contain a good balance of nutrients. • Explore the nutrients contained in fast food. • Use secondary sources to research the parts and functions of the skeleton. • Investigate patterns asking questions such as: Can people with longer legs run faster? Can people with bigger hands catch a ball better? • Compare, contrast and classify skeletons of different animals. 	<p>nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, joints, support, protect, move, skull, ribs, spine</p>
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Possible Enquiry Coverage	
Classifying	<ul style="list-style-type: none"> • Based on the children's own criteria: classify food items (leading to sorting by nutrients) or classify animals (leading to sorting by whether or not they have skeletons).
Observing over time	
Pattern seeking	<ul style="list-style-type: none"> • Children generate questions for investigation into objective 1 such as: Do 'healthy' drinks have less sugar? Does brown bread have more fibre?

	<ul style="list-style-type: none"> • Children generate questions for investigation into objective 2 such as: Do people with long arms throw further? Can people with short legs jump higher? Can people with longer legs run faster? Can people with bigger hands catch a ball more easily?
Comparative/fair testing	
Researching	<ul style="list-style-type: none"> • Look at food packaging to identify the amount of nutrients in different food items. • Research which types of food contain which nutrients. • Generate questions to research about the human skeleton.

Scientists across the curriculum	<p>Wilhelm Roentgen (Physicist who discovered x-rays)</p> <p>Marie Curie (Physicist who invented the first mobile x-ray machine to treat soldiers wounded on the battlefield in WW1)</p> <p>Adelle Davis (Biochemist and Nutritionist who linked health and diet)</p>
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Tower View Primary School Science Curriculum

Year 4 Animals, including Humans

National Curriculum Learning Objectives	<ul style="list-style-type: none"> Describe the simple functions of the basic parts of the digestive system in humans Identify the different types of teeth in humans and their simple functions Construct and interpret a variety of food chains, identifying producers, predators and prey. 	
Prior learning <ul style="list-style-type: none"> Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals, including humans) Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). (Y2 - Animals, including humans) Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. (Y2 - Animals, including humans) 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. (Y2 - Living things and their habitats) 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) 	Future learning <ul style="list-style-type: none"> Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. (Y6 - Animals, including humans) Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. (Y6 - Animals, including humans) Describe the ways in which nutrients and water are transported within animals, including humans. (Y6 - Animals, including humans) 	
Key learning <ul style="list-style-type: none"> The mouth is where food is chewed and broken down into smaller pieces The oesophagus is the tube that carries food from the mouth to the stomach The stomach is where food is broken down with stomach acid and churned around Nutrients are absorbed in the small intestine Water is absorbed and stools are formed in the large intestine Stools are stored in the rectum 	Possible experiences <ul style="list-style-type: none"> Explore what will happen if teeth aren't looked after (egg investigation) Draw/make a model of the digestive system Invite a health professional into school to talk about teeth/digestion Research the function of the parts of the digestive system. Explore eating different types of food to identify which teeth are being used for cutting, tearing and grinding (chewing). 	Vocabulary <p>Digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, teeth, incisor, canine, molar, premolars, herbivore, carnivore,</p>

<ul style="list-style-type: none"> • Stools leave the body through the anus <p>4 types of teeth and their functions:</p> <ul style="list-style-type: none"> • Incisors bite and cut • Canines tear and rip • Premolars hold and crush • Molars grind • Some people have wisdom teeth but they have no function now • Brushing teeth twice a day ensures that they stay healthy • Different animals have different teeth depending on their diet <p>Food chains show how animals get their energy:</p> <ul style="list-style-type: none"> • Food chains always start with a producer • A producer is a plant, a plant makes its own food • The arrow in a food chain means 'is food for' • Predators are animals that hunt and eat other animals • Prey are animals that get hunted and eaten by another animal 	<ul style="list-style-type: none"> • Classify animals as herbivores, carnivores or omnivores according to the type of teeth they have in their skulls. • Use food chains to identify producers, predators and prey within a habitat. • Use secondary sources to identify animals in a habitat and find out what they eat. 	<p>omnivore, producer, predator, prey, food chain</p>
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Possible Enquiry Coverage	
Classifying	<ul style="list-style-type: none"> • Compare and contrast different types of teeth (linking to simple functions). • Classify jaw bones/teeth to aid with making food chains e.g. recognise what eats plants and what eats animals by looking at their teeth.
Observing over time	<ul style="list-style-type: none"> • Observe what happens to an egg when it is left in different liquids (simulates teeth)
Pattern seeking	
Comparative/fair testing	
Researching	<ul style="list-style-type: none"> • Research the different parts of the digestive system. (Children present what they've learned in different ways: create a model, write a song, write a story, create a PPT, etc.) • Research what different animals eat within a specific environment, e.g. coral, polar, African grasslands, in order to construct food chains.

Scientists across the curriculum	<p>William Beaumont (Surgeon who first observed and studied human digestion as it occurs in the stomach)</p> <p>Washington and Lucius Sheffield (Dentists who invented toothpaste in a tube)</p> <p>Paul Sharpe (Bioengineer who studies how to regrow teeth if they become damaged)</p>
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Tower View Primary School Science Curriculum

Year 5 Animals, including Humans

National Curriculum Learning Objectives	<ul style="list-style-type: none"> Describe the changes as humans develop to old age 	
Prior learning <ul style="list-style-type: none"> Notice that animals, including humans, have offspring which grow into adults. (Y2 - 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 	Future learning <ul style="list-style-type: none"> 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. (KS3) 	
Key learning <ul style="list-style-type: none"> Fertilisation: The male and female sex cells fuse together Prenatal: The cells develop and grow into a foetus inside the mother's uterus. After around nine months, the baby is born. Infancy: Rapid growth and development. Children learn to walk and talk. Childhood: Children learn new skills and become more independent. Adolescence: The body starts to change over a few years (puberty). The changes occur to enable reproduction during adulthood. Much more independent. Early adulthood: The human body is at its peak of fitness and strength. Middle adulthood: Ability to reproduce decreases. There may be hair loss or hair may turn grey. Late adulthood: Leading a healthy lifestyle can help to slow down the decline in fitness and health which occurs during this stage. Death: usually occurs in old age (but not always). Elderly people are more vulnerable to infection and diseases which are difficult for them to recover from. 	Possible experiences <p>Link to RHSE topic</p> <ul style="list-style-type: none"> Create timeline with research about different stages of the human life cycle <p>This unit is likely to be taught through direct instruction due to its sensitive nature, although children can carry out a research enquiry by asking an expert e.g. school nurse to provide answers to questions that have been filtered by the teacher.</p>	Vocabulary <p>puberty, the vocabulary to describe sexual characteristics in line with the school's RSE policy</p> <p>life cycle, foetus, baby, child, adolescent, adult, reproduce, sexual, sperm, fertilises, egg, live young (Y5 - Living things and their habitats)</p>

<ul style="list-style-type: none"> • Puberty is the physical stage of development between childhood and adulthood. • The average life expectancy for a human in the UK is around 80 years old. 		
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Possible Enquiry Coverage	
Classifying	
Observing over time	
Pattern seeking	
Comparative/fair testing	
Researching	<ul style="list-style-type: none"> • Develop questions to ask an expert e.g. a health visitor, doctor or nurse. (Questions will need to be filtered by the teacher.)

Scientists across the curriculum	Virginia Apgar (Doctor and Medication Researcher who developed a method of evaluating the well-being of new-born babies) Robert Winston (Professor of Science and Society, Emeritus Professor of Fertility Studies and TV presenter)
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Tower View Primary School Science Curriculum

Year 6 Animals, including Humans

National Curriculum Learning Objectives	<ul style="list-style-type: none"> Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function Describe the ways in which nutrients and water are transported within animals, including humans. 	
Prior learning <ul style="list-style-type: none"> Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene (Y2 - Animals, including humans) 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 simple functions of the basic parts of the digestive system in humans (Y4 - Animals, including humans) Identify the different types of teeth in humans and their simple functions (Y4 - Animals, including humans) 	Future learning <ul style="list-style-type: none"> The consequences of imbalances in the diet, including obesity, starvation and deficiency diseases. (KS3) The effects of recreational drugs (including substance misuse) on behaviour, health and life processes. (KS3) The structure and functions of the gas exchange system in humans, including adaptations to function. (KS3) The mechanism of breathing to move air in and out of the lungs. (KS3) The impact of exercise, asthma and smoking on the human gas exchange system. (KS3) 	
Key learning <p>Main parts of the circulatory system:</p> <ul style="list-style-type: none"> Heart: an organ which constantly pumps blood in the blood vessels around the circulatory system Blood vessels: the tube-like structures that carry blood around the body (veins carry deoxygenated blood/carbon dioxide to the heart/lungs and arteries carry oxygenated blood away from the heart to the body) Blood carries nutrients, water and oxygen around the body to where they are needed <p>Exercise and health:</p>	Possible experiences <ul style="list-style-type: none"> Create a role play model for the circulatory system. Carry out a range of pulse rate investigations (examples below) Research the negative effects of drugs (e.g. tobacco) and the benefits of a healthy diet and regular exercise by asking an expert or using carefully selected secondary sources. 	Vocabulary <p>heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, cycle, circulatory system, diet, drugs, lifestyle</p>

<ul style="list-style-type: none"> • exercise increases our heart rate because the heart has to work harder and faster to pump blood around the body • Regular exercise reduces our heart rate as it gets stronger and more effective at pumping blood around the body (athletes often have a low resting heart rate) <p>Long and short term effects of diet, drugs and alcohol on the body:</p> <ul style="list-style-type: none"> • They can affect how well our hearts and lungs work, how likely we are to suffer from conditions, how clearly we think and generally how we feel • Tobacco can cause short-term effects such as shortness of breath, difficulty sleeping and loss of taste and long-term effects such as lung disease, cancer and death • Alcohol can cause short-term effects such as addiction and loss of control and long-term effects such as organ damage, cancer and death • A diet high in fat over a long period of time can cause blockages in the blood vessels and this restricts oxygen flow which can result in a heart attack • Some conditions are caused by deficiencies in our diet, e.g. lack of vitamins 		
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Possible Enquiry Coverage	
Classifying	
Observing over time	<ul style="list-style-type: none"> • Observe pulse rates before, during and after exercise. • Observe how long it takes for a pulse rate to return to resting pulse rate (testing recovery rate)
Pattern seeking	<ul style="list-style-type: none"> • Children generate questions for investigation such as: Do older people have lower pulse rates? Do boys have higher pulse rates?
Comparative/fair testing	<ul style="list-style-type: none"> • Complete different activities to compare the impact on their own heart rate.
Researching	<ul style="list-style-type: none"> • Generate questions to research about the human circulatory system. (Children present what they've learned in different ways: create a model, write a song, write a story, create a PPT, etc.)

Scientists across the curriculum	William Harvey (Doctor who discovered the nature of blood circulation and the function of the heart as a pump) Santorio Santorio (Doctor who invented an instrument to measure pulse accurately using a pendulum and did the first scientific study of the metabolism) Richard Doll (Doctor who proved the link between lung cancer and smoking) Ruth Ella Moore (Biologist who researched immunology, blood groups and tuberculosis) James Miranda Steuart Barry (Doctor – born Margaret Bulkley – who went to medical school by presenting as male and lived the rest of his life as a man. Became the Inspector General of military hospitals and improved conditions for wounded soldiers, native inhabitants, and performed the first caesarean section in Africa) Marie Maynard Daly (First black woman with a PhD in chemistry in the USA. She is known for her work on how our diet affects the health of our circulatory system)
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Tower View Primary School Science Curriculum

Living things and their habitats



Tower View Primary School Science Curriculum

Year 2 Living things and their habitats

National Curriculum Learning Objectives	<ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • 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) 	Future learning <ul style="list-style-type: none"> • 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) 	
Key learning <ul style="list-style-type: none"> • Every 'thing' is either living, dead or has never been alive • Living things need nutrients, water and warmth to survive • Living things include: plants, seeds and animals • Dead things have been alive in the past and needed nutrients, water and warmth to survive 	Possible experiences <ul style="list-style-type: none"> • Children observe and compare micro-habitats in their local area • Making simple observations by collecting and classifying objects into living, dead, never living • Create a choice chamber and see where living things choose to go, e.g. damp and dark • Use The Grufflo to introduce food chains and work out the food chain in the story 	Vocabulary living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed, water, air, survive, survival, names of local habitats (e.g. pond, woodland etc.), names of

<ul style="list-style-type: none"> • Dead things include dead animals, plants and parts of plants that are no longer attached, e.g. leaves, twigs, shells, fur, hair and feathers • Things that have never been alive don't need nutrients, water or warmth <p>Habitats:</p> <ul style="list-style-type: none"> • All living things live in a habitat • Some living things live in a micro-habitat (e.g. on the bark of a tree) • Habitats can be hot or cold, wet or dry, on the ground or up high • A habitat provides food, shelter and water • The living thing is adapted to their habitat - they have features to help them move, find food and grow well in their surroundings • Animals get their food from other living things: • Living things in a habitat depend on each other for survival • A food chain shows how animals get their energy • The arrow in a food chain means 'is food for' <p>Children do not need to know the terms producer, predator or prey</p>	<ul style="list-style-type: none"> • Observe animals and plants carefully, drawing and labelling diagrams • Revisit the topic during the different seasons to see if the habitats have changed/the living things in them • Create simple food chains for a familiar local habitat from first-hand observations and research 	<p>micro-habitats (e.g. under logs, in bushes etc.), conditions, light, dark, shady, sunny, wet, damp, dry, hot, cold, names of living things in the habitats and micro-habitats studied</p>
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Possible Enquiry Coverage

Classifying	<ul style="list-style-type: none"> • Find things that are living. • Find things that are dead. • Find things that have never been alive. • Classify things found in the environment (choosing their own criteria to do so), leading to living, dead and never been alive. • Classify minibeasts found in the environment based on physical structure. • Classify plants found in the environment.
Observing over time	<ul style="list-style-type: none"> • Explore animals in micro-habitats throughout the year (under a rock, under a log, in a pond, in a bush, in the long grass). • Explore plants in micro-habitats throughout the year (e.g. woodland area, ponds, meadows).
Pattern seeking	<ul style="list-style-type: none"> • Children generate questions for investigation such as: Are there more daisies in the meadow or on the field? Where do you see more ivy? Where do you see more butterflies? Where do snails live?
Comparative/fair testing	
Researching	<ul style="list-style-type: none"> • Use secondary sources to name plants and animals seen in the local environment that they may not currently be able to name (Leafsnap UK on Apple App Store, SEEK INaturalist on google play and Apple App Store, textbooks, Woodland Trust resources). • Research what animals they have first-hand experience of eat.

Scientists across the curriculum	<p>William Kirby (Father of modern entomology, the study of insects)</p> <p>Prem Singh Gill (Polar Scientist who studies where Antarctic seals live, breed and feeds, so we can know more about where they prefer to live)</p> <p>Dawood Qureshi (Marine Biologist who studies wildlife in the ocean)</p>
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Tower View Primary School Science Curriculum

Year 4 Living things and their habitats

National Curriculum Learning Objectives	<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 dangers to living things 	
Prior learning <ul style="list-style-type: none"> 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) Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). (Y1 – Animals, including humans) Identify and name a variety of plants and animals in their habitats, including microhabitats. (Y2 - Living things and their habitats) 	Future learning <ul style="list-style-type: none"> 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) 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. (Y6 - Living things and their habitats) Give reasons for classifying plants and animals based on specific characteristics. (Y6 - Living things and their habitats) 	
Key learning <ul style="list-style-type: none"> Vertebrates are animals with a backbone The mains groups of vertebrates are fish, amphibians, reptiles, birds and mammals Invertebrates are animals with no backbone The main groups of invertebrates are insects, spiders, worms, snails and slugs (scientific terms come in Y6) <p>Plants can be grouped:</p>	Possible experiences <ul style="list-style-type: none"> Grouping by observable characteristics (specific characteristics comes in Y6) Exploring local and wider habitats - trip to nature reserve Classify living things in different ways, e.g. Venn diagram, Carol diagram, simple classification keys Use simple classification keys Create own classification keys to use 	Vocabulary Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate

<ul style="list-style-type: none"> • Some plants are flowering plants • Some plants are non-flowering plants, such as ferns and mosses <p>Humans can have positive and negative impacts on a habitat:</p> <ul style="list-style-type: none"> • Changing a habitat has an effect on the things living in it • Positive: nature reserves, ecologically planned parks, garden ponds • Negative: growing population, litter, deforestation, global warming, urbanisation, invasive species • Habitats and the living things in it can change with the seasons) • Living things depend on each other for survival; if one living thing is taken away, the others may not survive, or may have to adapt (adaptation in detail is covered in Y6) 	<ul style="list-style-type: none"> • Visit a local nature reserve or have a visitor come in to talk about their work 	
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Possible Enquiry Coverage	
Classifying	<ul style="list-style-type: none"> • Based on the children's own criteria: classify a number of living things in their local environment (plants and animals), classify a number of living things in the wider environment (plants and animals) after completing research, introduce branching databases/dichotomous keys.
Observing over time	<ul style="list-style-type: none"> • Observe living things in their local environment at different times of the year.
Pattern seeking	<ul style="list-style-type: none"> • Do animals with have? • Do plants with have?
Comparative/fair testing	
Researching	<ul style="list-style-type: none"> • Research and be able to name plants and animals in the wider environment e.g. polar, desert, jungle, etc. • Research global environmental issues and their impact on living things.

Scientists across the curriculum	<p>Jacques Cousteau (Oceanographer and co-inventor of the aqualung)</p> <p>Rachel Carson (Aquatic Biologist who wrote about environmental pollution)</p> <p>Wangari Maathai (Biologist and Environmental Activist awarded the 2004 Nobel Peace Prize for her contribution to sustainable development)</p>
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	Kelsey Archer Barnhill (Deep Sea Ecologist who sends robots to the seafloor to collect samples of different animals to study) Liz Bonnin (TV presenter and Wildlife Conservationist) Gerald Durrell (Conservationist who worked hard to save Madagascar's unique plants and animals)
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Tower View Primary School Science Curriculum

Year 5 Living things and their habitats

National Curriculum Learning Objectives	<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. 	
Prior learning	Future learning	
<ul style="list-style-type: none"> Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals, including humans) Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. (Y3 - Plants) 	<ul style="list-style-type: none"> 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. (KS3) Reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, including quantitative investigation of some dispersal mechanisms. (KS3) 	
Key learning	Possible experiences	Vocabulary
<p>Describe/compare the differences in life cycles between:</p> <ul style="list-style-type: none"> Mammal, dog: fertilisation, embryo, live birth, young, adult Amphibian, frog: egg mass, fertilisation, hatching, tadpole, tadpole with legs, young frog, adult Insect, butterfly: fertilisation, egg laying, larva, pupa, adult Bird, chicken: fertilisation, egg laying, hatching, young, adult <p>Simple versions of these life cycles are taught in Y2</p> <p>Most animals reproduce sexually:</p> <ul style="list-style-type: none"> Most animals contain 1 type of sex cell, either male or female Sperm is the name of the male sex cell Egg/ovule is the name of the female sex cell Sexual reproduction requires two parents (one with a male sex cell and one with a female sex cell) Reproduction occurs when the sperm from the male fertilises the female egg Offspring are similar but not identical 	<ul style="list-style-type: none"> Observe and compare the life cycles of plants in the local environment & with other plants around the world. Research a living thing of the child's choice and compare to previous learning. Hatch eggs and allow children to keep an observation diary Invite a beekeeper into school to talk to the children about the role of insects in the life cycle of flowers. Dissecting flowers to see the different parts (male and female). 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. 	<p>life cycle, reproduce, sexual, fertilises, asexual, plantlets, runners, tubers, bulbs, cuttings</p>

<p>Most plants reproduce sexually:</p> <ul style="list-style-type: none"> • Most plants contain both the male and female sex cells but most plants cannot fertilise themselves • Two parent plants are needed for sexual reproduction • Pollen (male sex cell) from the stamen (male part) of one plant is transferred to the stigma (female part) of another • The pollen travels down a tube through the style and fuses with an ovule (female sex cell) • Fertilisation in a plant is where the new seed is formed • Offspring are similar but not identical <p>Some plants reproduce asexually:</p> <ul style="list-style-type: none"> • One parent plant is needed to create offspring • Offspring are genetically identical to the parent • The most common way to encourage asexual reproduction is by propagating (taking cuttings, chitting potatoes) • Asexually reproduced offspring are an exact copy of the parent • Examples of plants that reproduce asexually: strawberry plants, potatoes, spider plants, daffodils 	<ul style="list-style-type: none"> • Try to grow new plants from different parts of the parent plant, e.g. seeds, stem, root cuttings, tubers, bulbs. • 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. • Plant bulbs and then harvest to see how they multiply. • Use secondary sources to find out about pollination. 	
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Possible Enquiry Coverage	
Classifying	<ul style="list-style-type: none"> • Classify animals according to their life cycle
Observing over time	<ul style="list-style-type: none"> • Grow from cuttings and observe whether they grow roots/stem/ leaf/flower. • Grow from, and harvest, bulbs through the year. (Can be done in conjunction with Year 2.) • Observe strawberry/spider plants through the year.
Pattern seeking	<ul style="list-style-type: none"> • Children generate questions such as: Do larger mammals have longer gestation periods? Do larger animals live longer? Do smaller animals lay more eggs?
Comparative/fair testing	
Researching	<ul style="list-style-type: none"> • Generate questions to research the life cycle of a chosen animal: mammal, amphibian, insect, bird e.g. dragon fly, cuckoo, salmon, worm, owl. (Children present what they've learned in different ways: create a model, write a song, write a story, create a PPT, etc.) • Research how gardeners asexually reproduce plants.

Scientists across the curriculum	Jacques Cousteau (Oceanographer and co-inventor of the aqualung) Rachel Carson (Aquatic Biologist who wrote about environmental pollution) Wangari Maathai (Biologist and Environmental Activist awarded the 2004 Nobel Peace Prize for her contribution to sustainable development) Kelsey Archer Barnhill (Deep Sea Ecologist who sends robots to the seafloor to collect samples of different animals to study) Liz Bonnin (TV presenter and Wildlife Conservationist) Eva Crane (Physicist who became interested in bees' behaviour and life cycle. She studied bees around the world and wrote about her discoveries. The Eva Crane Trust was set up to further understand the life of bees around the world)
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Tower View Primary School Science Curriculum

Year 6 Living things and their habitats

National Curriculum Learning Objectives	<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 micro-organisms, plants and animals. Give reasons for classifying plants and animals based on specific characteristics. 	
Prior learning <ul style="list-style-type: none"> 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) 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) 	Future learning <ul style="list-style-type: none"> Differences between species. (KS3) 	
Key learning <p>Living things can be classified into 3 main groups: animals, micro-organisms and plants</p> <p>Animals can be divided into 2 groups: vertebrate and invertebrates:</p> <p>Vertebrates:</p> <ul style="list-style-type: none"> Mammals: breathe with lungs, offspring are born live, body hair or fur, steady body temperature, feeds the offspring milk Fish: breathe with gills, lay eggs in water, have fins and scales, body temperature changes Amphibians: born with gills then develop lungs, lay eggs in water, damp skin, body temperature changes Reptiles: breathe with lungs, lay eggs on land, dry scaly skin, body temperature changes Birds: breathe with lungs, lay eggs with hard shells, have feathers, steady body temperature <p>Invertebrates:</p> <ul style="list-style-type: none"> Insects: have 3 body sections and 6 legs Arachnids: 2 body sections and 8 legs 	Possible experiences <ul style="list-style-type: none"> Use secondary sources to learn about the formal classification system devised by Carl Linnaeus and why it is important. Classifying living things into smaller sub-groups, e.g. daffodils into types of daffodils. Classify living things in a variety of ways, e.g. Venn diagrams, Carroll diagrams. Explore living things in the local environment. Invite an expert into school to talk about the characteristics of living things. Compare the characteristics of animals in different groups. 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. 	Vocabulary <p>vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, warm-blooded, cold-blooded, insects, spiders, snails, worms, flowering, non-flowering, mosses, ferns, conifers</p>

<ul style="list-style-type: none"> • Molluscs: slimy foot and often have a shell <p>Micro-organisms:</p> <ul style="list-style-type: none"> • Living things that are not plants or animals • Can be split into further groups, including fungi, algae, bacteria, viruses <p>Plants can be divided into two main groups:</p> <ul style="list-style-type: none"> • Plants that produce seeds: flowering plants and conifers • Plants that do not produce seeds: ferns and mosses 	<ul style="list-style-type: none"> • Use information about the characteristics of an unknown animal or plant to assign it to a group. • Create an imaginary animal which has features from one or more groups. 	
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Possible Enquiry Coverage	
Classifying	<ul style="list-style-type: none"> • Classify animals according to Carl Linnaeus' system. • Classify plants into flowering, mosses, ferns and conifers, based on specific characteristics. • Create a branching database/dichotomous key to classify a set of living things.
Observing over time	
Pattern seeking	
Comparative/fair testing	
Researching	<ul style="list-style-type: none"> • Research the characteristics of a vertebrate/invertebrate group. (Children present what they've learned in different ways: create a model, write a song, write a story, create a PPT, etc.) • Research the characteristics of flowering plants, mosses, ferns and conifers. • Research the difference between bacteria, virus and fungi to give reasons why these are not plants or animals. • Research how micro-organisms can be helpful or harmful. • Research unusual animals e.g. axolotl, platypus, kangaroos etc.

Scientists across the curriculum	<p>David Attenborough (Naturalist and TV presenter)</p> <p>Jane Goodall (Wildlife Researcher and Conservationist who studied chimpanzees)</p> <p>Roger Arliner Young (Zoologist who studied reproduction in marine organisms)</p> <p>Ernest Everett Just (Zoologist who studied the early development of marine invertebrates)</p> <p>Libbie Hyman (Zoologist best known for work on classification of invertebrates)</p>
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Tower View Primary School Science Curriculum

Plants



Tower View Primary School Science Curriculum

Year 1 Plants

National Curriculum Learning Objectives	<ul style="list-style-type: none"> 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. 	
Prior learning RECEPTION To be confirmed	Future learning <ul style="list-style-type: none"> Observe and describe how seeds and bulbs grow into mature plants. (Y2 - Plants) Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. (Y2 - Plants) Identify and name a variety of plants and animals in their habitats, including microhabitats. (Y2 - Living things and their habitats) Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. (Y3 - Plants) Investigate the way in which water is transported within plants. (Y3 - Plants) 	
Key learning Name wild plants and trees <ul style="list-style-type: none"> Wild plants and trees grow naturally and are not looked after Bluebells are common wild plants Birch trees are wild trees Name common garden plants and trees <ul style="list-style-type: none"> Garden plants and trees are planted by humans and are looked after Sunflowers are common garden plants that grow from seed Daffodils are common garden plants that grow from bulbs (these are toxic if consumed) Observe the structure of plants and trees:	Possible experiences <ul style="list-style-type: none"> Children explore the plants and trees in their local environment. Children plant seed and bulbs. Children observe the growth of flowers and vegetables that they have planted. Children observe how the flowers change over time from when they are planted. Links to changes of the seasons with leaves falling off trees, buds opening, etc. Make close observations of leaves, seeds, flowers etc. Compare two leaves, seeds, flowers etc. Classify leaves, seeds, flowers etc. using a range of characteristics. 	Vocabulary Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud. Evergreen, deciduous, wild, Names of trees in the local area Names of garden and wild flowering plants in the local area

<ul style="list-style-type: none"> • Seeds and bulbs grow into plants and trees • Plants have: roots, leaves, stem, flower, fruit • Trees have: roots, trunk, branches, twigs, leaves and fruit <p>Some trees are deciduous and some are evergreen:</p> <ul style="list-style-type: none"> • Plants or trees that keep their leaves all year are evergreen, e.g. conifers • A tree that loses its leaves in autumn and grows new ones in spring is deciduous, e.g. oak trees 	<ul style="list-style-type: none"> • Identify plants by matching them to named images. • When further afield, spot plants that are the same as those in the local area studied regularly, describing the key features that helped them. 	
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Possible Enquiry Coverage	
Classifying	<ul style="list-style-type: none"> • Allow children to classify leaves, flowers, and seeds, choosing their own criteria.
Observing over time	<ul style="list-style-type: none"> • Observe a tree through the year. • Observe a trail/patch to identify how plants change through the year.
Pattern seeking	<ul style="list-style-type: none"> • Based on observations, encourage children to identify patterns e.g. after comparing the size of leaves on different plants, children may suggest “bigger plants have bigger leaves.”
Comparative/fair testing	
Researching	<ul style="list-style-type: none"> • Use secondary sources to name plants (including trees) based on observations of leaves, seeds, flowers, buds, and bark (Leafsnap UK on Apple App Store, SEEK INaturalist on google play and Apple App Store, textbooks, Woodland Trust resources).
Scientists across the curriculum	Maria Sibylla Merian (German artist, scientific illustrator, and naturalist)



Tower View Primary School Science Curriculum

Year 2 Plants

National Curriculum Learning Objectives	<ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • 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) 	Future learning <ul style="list-style-type: none"> • 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) • Describe the life process of reproduction in some plants and animals (Y5 – Living things and their habitats) 	
Key learning <p>Germination is when a seed begins to grow:</p> <ul style="list-style-type: none"> • Germination: the seeds cracks and roots begin to grow, the shoots, grows, green leaves develop on the shoot. • After germination, the plant continues to grow into a flower or tree • Observe germination of seeds from fruit/veg • Observe germination of hyacinths from bulbs <p>Plants need certain conditions in order to grow and survive:</p> <ul style="list-style-type: none"> • Seeds don't need light to begin growing • Seeds begin germination using the food stored inside the seed 	Possible experiences <ul style="list-style-type: none"> • Children observe and compare how seeds and bulbs look different from plant to plant. • Classify seeds and bulbs • Research and plan when and how to plant a range of seeds and bulbs • Plant bulbs and seeds in clear pots to observe the germination process. • Look after plants as they grow – weeding, thinning, watering • Test the growth of different seeds/bulbs with varying amounts of water, light and temperature. Measure and record relevant observations. 	Vocabulary <p>light, shade, Sun, warm, cool, water, space, grow, healthy, bulb, germinate, shoot, seedling</p>

<ul style="list-style-type: none"> Plants need the right amounts of warmth, light and water to survive If plants get too hot or too cold, they will die If plants have too much/too little light and water, they will die 	<ul style="list-style-type: none"> Make links to healthy eating (animals including humans unit) and grow plants from fruit seeds. 	
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Possible Enquiry Coverage	
Classifying	<ul style="list-style-type: none"> Based on the children's own criteria: classify seeds, classify bulbs.
Observing over time	<ul style="list-style-type: none"> Plant seeds and bulbs and observe how they grow.
Pattern seeking	<ul style="list-style-type: none"> Children generate questions for investigation such as: Do big seeds germinate more quickly? Does it matter which way round you plant a bulb or seed? Which comes first, the root or the shoot?
Comparative/fair testing	
Researching	<ul style="list-style-type: none"> Look at packets to decide how to plant and care for seeds e.g. How much water do they need? Do they need shade/full sun?

Scientists across the curriculum	<p>Daniel Solander (Botanist who worked with Joseph Banks on Captain Cook's voyage around the World)</p> <p>Joseph Banks (Naturalist on Captain Cook's voyage around the World)</p> <p>Thomas Wyatt Turner (Botanist who studied plant disease)</p> <p>Poppy Okotcha (Horticulturalist interested in the connection between healthy environments, healthy food, and healthier people)</p> <p>Dr Ben Woodcock (Ecological Entomologist who helps farmers grow food, so it is fare for insects and other wildlife)</p> <p>Angie Burnett (Plant Biologist who grows plants and sees how they react to different conditions that make it more difficult for them to grow)</p> <p>Jane Colden (Thought to be America's first woman botanist)</p>
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Tower View Primary School Science Curriculum

Year 3 Plants

National Curriculum Learning Objectives	<ul style="list-style-type: none"> 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. 	
Prior learning <ul style="list-style-type: none"> Observe and describe how seeds and bulbs grow into mature plants. (Y2 - Plants) Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. (Y2 - Plants) 	Future learning <ul style="list-style-type: none"> Describe the life process of reproduction in some plants and animals. (Y5 - Living things and their habitats) Reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, including quantitative investigation of some dispersal mechanisms. (KS3) 	
Key learning <p>Every part of a plant has a job to do:</p> <ul style="list-style-type: none"> Roots anchor the plant into the ground and absorb nutrients from soil Stem holds the plant up and carries the nutrients up the plant Leaves make nutrients for the plant Flowers make seeds (sunflowers and poppies show these clearly) Water from the ground travels up through the roots and stem to the leaves and flower (celery and carnations show this clearly) <p>Plants need certain conditions in order to grow and survive (observe already established plants, such as cactuses or peace lilies) Y2 looking at basics (soil, water, warmth), Y3 exploring what happens if you alter those basic conditions</p>	Possible experiences <ul style="list-style-type: none"> Explore plants from an already established shoot (Y2 covers germination). Observe the process of a mature plant dying Explore and research the requirement for survival for different plants, e.g. a cactus. Observe coloured water being transported through a carnation or through celery. Explore different factors on plant growth, e.g. type of soil, fertiliser, room to grow. Observe what happens to plants over time when the leaves or roots are removed. 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 	Vocabulary <p>pollen, insect/wind pollination, male, female, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersal), air, nutrients, minerals, soil, absorb, transport</p>

<p>I know the life cycle of a plant:</p> <ul style="list-style-type: none"> • Germination is the beginning of the cycle (covered in Y2) • Shoots/seedlings grow and strengthen • Flower buds develop into flowers • Pollination is where pollen is carried from one plant to another • This forms seeds, sometimes contained in berries or fruit • Pollination can happen in 4 ways: by insects, birds, animals or the wind • Seed dispersal is where the seeds formed from one plant move and are sown • Seed dispersal occurs via animals, humans, wind or water <p>Seed lands and the cycle begins again Y5 look specifically at sexual and asexual reproduction.</p>	<p>soil, different fertilisers, varying amount of space.</p> <ul style="list-style-type: none"> • Observe flowers carefully to identify the pollen. • Observe flowers being visited by pollinators e.g. bees and butterflies in the summer. • 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. 	
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Possible Enquiry Coverage	
Classifying	<ul style="list-style-type: none"> • Classify flowers based on the children's own criteria. (This does not meet the curriculum objectives for this topic, but it is a good opening activity to assess prior knowledge.)
Observing over time	<ul style="list-style-type: none"> • Observe celery (with roots and leaves) in coloured water. • Observe white carnations (freshly cut) in coloured water. • Gather seeds and photographic evidence of blossoms/flowers and berries on a particular trail throughout the year.
Pattern seeking	<ul style="list-style-type: none"> • Investigate what happens when conditions are changed e.g. more/less light/water, change in temperature, nutrients (Baby Bio vs other brands).
Comparative/fair testing	
Researching	<ul style="list-style-type: none"> • Research the functions of the parts of flowering plants. • Research different methods of seed dispersal. • Research different methods of pollination.

Scientists across the curriculum	Carl Linnaeus (Botanist who studied the conditions for successfully growing bananas and developed a method to reproduce them in Europe) Charles Henry Turner (Zoologist who made ground-breaking discoveries about insect behaviour) Jagadish Chandra Bose (Biophysicist who measured plant response to different stimuli) George Washington Carver (Agricultural Scientist who encouraged the planting of different crops to prevent soil degradation)
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Tower View Primary School Science Curriculum

Seasonal changes



Tower View Primary School Science Curriculum

Year 1 Seasonal Changes

National Curriculum Learning Objectives	<ul style="list-style-type: none"> • Observe changes across the four seasons. • Observe and describe weather associated with the seasons and how day length varies 	
Prior learning	Future learning <ul style="list-style-type: none"> • Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. (Y3 - Light) • Use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky. (Y5 - Earth and space) • The seasons and the Earth's tilt, day length at different times of year, in different hemispheres. (KS3) 	
Key learning <ul style="list-style-type: none"> • There are 4 seasons: autumn, winter, spring and summer • In the UK, usually, the weather and temperature changes with the seasons: autumn gets colder, winter is the coldest, spring gets warmer, summer is the hottest • Autumn and winter are often rainier, and spring and summer are often drier • The length of daylight in mid-summer is longer than in mid-winter <p>The change in weather causes many other changes:</p> <ul style="list-style-type: none"> • Numbers and types of animals found in local habitats • Seed and plant growth • Leaves on trees (autumn leaves turn brown and fall off, no leaves in winter, new leaves grow in spring and full leaves in summer) • Types of clothes worn by people (more layers in winter, fewer in summer) 	Possible experiences <ul style="list-style-type: none"> • Go for regular walks around the local area to observe changes • Create a photo diary and annotate observations and comparisons • Collect information about the weather regularly throughout the year. • Present this information in tables and charts to compare the weather across the seasons. • Collect information, regularly throughout the year, of features that change with the seasons e.g. plants, animals, humans. • Present this information in different ways to compare the seasons. • Gather data about day length regularly throughout the year and present this to compare the seasons. 	Vocabulary <p>weather, sunny, rainy, raining, shower, windy, snowy, cloudy, hot, warm, cold, storm, thunder, lightning, hail, sleet, snow, icy, frost, puddles, rainbow, seasons, winter, summer, spring, autumn, Sun, sunrise, sunset, day length</p>

<ul style="list-style-type: none"> • Spring is often associated with offspring being born (lambs, chicks, etc.) • One of the best indicators of the time of year is the trees • It is not safe to look directly at the sun, even with sunglasses 		
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Possible Enquiry Coverage	
Classifying	
Observing over time	<ul style="list-style-type: none"> • Take weather measurements and make observations over time. • Record/Photograph what children are wearing (jumper, coat, hats, scarves, etc.) • Make observations of daylight hours e.g. send a diary and toy bear home with one child each day and ask the child to record their activities, but the bear needs to go to bed when it gets dark and the children must record the time this happens. (This gathers evidence, over time, that day length changes and so do activities.)
Pattern seeking	<ul style="list-style-type: none"> • At the end of the year, look for patterns in evidence e.g. Does it rain more in spring? Do we have more sunny days in the summer? Which was the coldest month?
Comparative/fair testing	
Researching	
Scientists across the curriculum	Jim Cantore (Meteorologist and storm tracker)



Tower View Primary School Science Curriculum

Evolution and inheritance



Tower View Primary School Science Curriculum

Year 6 Evolution and Inheritance

National Curriculum Learning Objectives	<ul style="list-style-type: none"> 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. 	
Prior learning <ul style="list-style-type: none"> 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. (Y2 - Living things and their habitats) Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals, including humans) Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. (Y3 - Plants) Describe in simple terms how fossils are formed when things that have lived are trapped within rock. (Y3 - Rocks) Recognise that environments can change and that this can sometimes pose dangers to living things. (Y4 - Living things and their habitats) Describe the life process of reproduction in some plants and animals. (Living things and their habitats - Y5) 	Future learning <ul style="list-style-type: none"> Heredity as the process by which genetic information is transmitted from one generation to the next. (KS3) A simple model of chromosomes, genes and DNA in heredity, including the part played by Watson, Crick, Wilkins and Franklin in the development of the DNA model. (KS3) The variation between species and between individuals of the same species means some organisms compete more successfully, which can drive natural selection. (KS3) Changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction. (KS3) 	
Key learning Inheritance: <ul style="list-style-type: none"> All living things have offspring of the same kind as features are inherited from the parents (links to sexual reproduction Y5) Due to sexual reproduction, offspring are not identical to their parents and do vary 	Possible experiences <ul style="list-style-type: none"> Explore how animals in the local area are adapted to their environment. Look at the work carried out by Mary Anning, Charles Darwin and Alfred Wallace. 	Vocabulary offspring, sexual reproduction, vary, characteristics, suited, adapted, environment,

<ul style="list-style-type: none"> • New cross-breeds of dog are created when different breeds mate <p>Evolution:</p> <ul style="list-style-type: none"> • Plants and animals have characteristics that make them suited (adapted) to their environment • Cactuses are well suited to the dessert due to their characteristics • If an environment changes rapidly, the living thing may die as it is no longer adapted/suited • If the environment changes slowly, the living things that are best suited will survive in greater numbers and reproduce • Overtime, the inherited characteristics become dominant • Sometimes, living things change so much over time that a new species is created • Darwin's finches, the length of giraffes' necks and the fur on arctic foxes, peppered moth • Fossils give us evidence of what lived on Earth long ago • Fossils are the evidence that support the theory of evolution 	<ul style="list-style-type: none"> • Analyse the advantages/disadvantages of specific adaptations. • Think about their own families and inherited characteristics, e.g. hair and eye colour, height. • 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 (Link to Victorians) • Make observations of fossils to identify living things that lived on Earth millions of years ago. • 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. 	<p>inherited, species, fossils, evolve, evolution</p>
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Possible Enquiry Coverage	
Classifying	<ul style="list-style-type: none"> • To show variation in a species: classify a species of animal e.g. cats, dogs, classify a species of plant e.g. daffodils, tulips, lilies.
Observing over time	
Pattern seeking	<ul style="list-style-type: none"> • Use different pieces of equipment, e.g. chopsticks, toothpicks, cutlery, to look for patterns linking the suitability of bird beaks for the available food e.g. rice, grapes, raisins.
Comparative/fair testing	
Researching	<ul style="list-style-type: none"> • Research different types of a species and their characteristics making them suitable for different habitats e.g. penguins.

Scientists across the curriculum	Mary Anning (Fossil hunter who developed the theory that dinosaurs had become extinct a long time ago) Charles Darwin (Natural Historian who developed the theory of evolution by natural selection) Alfred Wallace (Natural Historian who developed the theory of evolution by natural selection) Nettie Stevens (Geneticist who concluded that sex is inherited as a chromosomal factor and that males determine the gender of offspring) Emma Dunne (Paleobiologist who investigates how ancient climate change affected the evolution of different species) Telma Laurentino (Evolutionary Biologist who measures differences in the colour of lizards that live in white desert sands to find differences in their genes which might have allowed them to survive in such an extreme environment)
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