

Science

At Norton Community Primary School

Our science curriculum engages and enthuses children by providing relevant, first-hand experiences of scientific phenomena in the everyday world. From their low starting points, children build secure knowledge and terminology for each area of study. Excellent teaching ensures this is consolidated and extended during children’s time at our school.

We encourage children to develop and maintain an inquisitive mind, questioning what they see, hear and feel. Children’s ideas are valued and respected. Teachers’ detailed yet flexible planning ensures that children’s natural curiosity is captured to enable them to extend their scientific understanding.

From an early age, children are supported to think scientifically, using new vocabulary to effectively communicate their thoughts and observations. As they progress through the Programme of Study, teachers guide children to plan, lead and reflect on scientific investigations, developing independent thought and learning.

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Year One

Y1 - Animals including humans

Content

Children will learn to identify and name common animals including fish, amphibians, reptiles, birds and mammals.

Terminology

fish, amphibians, reptiles, birds, mammals, carnivore, herbivore, omnivore, tame, wild, nocturnal

Scientific Enquiries

- Using classification trees to classify animals using soft toys as representations (**classifying and grouping**).
- Asking questions about animals and using books and the internet to research them (**research using secondary sources**)

Books

- Bog Baby- Jeanne Willis
- The Enormous Crocodile- Roald Dahl
- Argh Spider- Lydia Monks
- The Owl and the Pussycat- Edward Lear

Y1 - Plants

Content

Children will learn to identify and name common wild and garden plants, including deciduous and evergreen trees. They learn to describe the basic structure of flowers and plants.

Terminology

leaves, flowers, petals, fruit, roots, bulb, seed, trunk, branches, stem

Scientific Enquiries

- Grouping different types of plants (**classifying and grouping**)
- Observing plants over the year and keeping record of how they have changed (**observation over time**)
- *Do trees with bigger leaves lose their leaves first in autumn?* (**pattern seeking**)

Books

- Jim and the Beanstalk- Raymon Briggs
- Oliver's Vegetables- Vivian French
- The Little Gardener- Emily Hughes
- Lollipop and Grandma's Back Garden Safari- Penelope Harper

Y1 - Seasonal changes

Content

Children will observe changes across the four seasons. They will observe and describe weather associated with the seasons and how day length varies.

Terminology

Autumn, Spring, Summer, Winter, weather, temperature, thermometer, weather symbol, deciduous, coniferous

Scientific Enquiries

- Children to keep records of the weather and discuss patterns (**pattern seeking**)
- *Is it always windy when it is raining?*
- *Does the wind always blow the same way?*

Books

- The Rabbit Problem- Emily Gravett
- Kate, Who Tamed the Wind - Liz Garton Scanlon and Lee White

- Ollie's Magic Bunny - Nicola Killen
- Tree: Seasons Come and Go - Britta Tekentrap
- Moon - Britta Tekentrap
- The Best Bear in the World - A.A. Milne
- Poetry: Autumn Fires and the Gardener - Robert Louis Stephenson

Y1 - Everyday materials

Content

Children will learn to identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. They will be taught to describe the simple physical properties of a variety of everyday materials.

Terminology

hard, soft, stretchy, stiff shiny, dull, rough, smooth, waterproof, not waterproof

Scientific Enquiries

- Which is the best material to make a model house, an umbrella etc. **(fair testing)**
- *Is there a pattern in the types of materials that are used to make objects in a school?* **(pattern seeking)**

Books

- Beegu (*What does Beegu think of life on Earth?*) Alexis Deacon
- Dogger (*Why is Dogger a good toy? What if he was made of something else?*)
- Goldilocks and the Three Bears (*What makes something right?*)
- The Three Little Pigs (Their houses are made of different materials. What happens differently?)

Year Two

Y2 - Animals including humans

Content

Children will find out about and describe the basic needs of animals, including humans, for survival (water, food and air). They will be introduced to the processes of reproduction and growth in animals. They will learn about the importance of exercise, eating the right amounts of different types of food, and hygiene.

Terminology

healthy, diet, offspring, exercise, proteins, carbohydrates, fats, nutrition, survival, hygiene

Scientific Enquiries

- Researching and recording the growth of different animals (**research using secondary sources**)
- *Who has the largest hand-span?* (**Pattern seeking** between hand-span and height or feet size)
- *Which habitat do worms prefer? Where can we find the most worms?* (**pattern spotting**)
- *Which offspring belongs to which animal?* (**identifying, grouping and classifying**)

Books

- Burger Boy- Alan Durant
- Handa's surprise- Eileen Brown
- Little Mist- Angela McAllister
- Dr Dog- Barbette Cole
- Big Smelly Bear- Britta Teckentrup

Y2 - Plants

Content

Children will be introduced to the requirements of plants for germination, growth and survival, as well as to the processes of reproduction and growth in plants. Throughout the year they will observe how different plants grow.

Terminology:

oxygen, carbon dioxide, habitat

Scientific Enquiries:

- Observing and recording the growth of a plant over time (**observation over time**)
- What conditions do plants need to grow? (**comparative test** of plants growing in different locations- dry, wet, light, dark.

Books

- Little Evie in the Wild Wood - Jackie Morris
- A Seed is Sleepy - Dianna Aston
- The Little Fir Tree - Christopher Corr
- Miss Maple's Seeds - Eliza Wheeler
- Paddington in the Garden - Michael Bond

Y2 - Living things and their habitats.

Content

Children will explore and compare the differences between things that are living, dead, and things that have never been alive. They will be introduced to the terms **habitat** and **micro-habitat** and describe the suitability of habitats. They will be introduced to simple **food chains** to identify different sources of food.

Terminology

sea, rivers, woodland, ponds, rainforest, desert, species, microhabitats, prey, predator

Scientific Enquiries

- Children to explore how the conditions of a habitat affect the number of woodlice (**Pattern Seeking**)
- *Where do we find the most woodlice?*

Books

- A Tadpole's Promise - Jeanne Willis
- The Tales of Jemima Puddleduck, Jeremy Fisher and Squirrel Nutkin
- The Ladybird Big Book of Dead Things - Ned Hartley
- Run Wild - David Covell (online)
- There's a Rang-Tan in my Bedroom - James Sellick
- An Otter Called Pebble - Helen Peters
- The Big Book of the Blue - Yuval Zommer
- When the Bees Buzzed Off - Lula Bell
- The Coral Kingdom - Laura Knowles
- Tad- Benji Davies (online)

Y2 - Uses of everyday materials.

Content

Children will identify and discuss the uses of different everyday materials so that they become familiar with how some materials are used for more than one thing. They will learn to consider the properties of materials that make them suitable or unsuitable for particular purposes.

Terminology

absorbent, opaque, transparent

Scientific Enquiries

- Which material makes the best waterproof jacket? (**comparative testing**)

Books:

- Traction Man (What would Traction Man use to build our school?) - Mini Grey
- Suzy Orbit Astronaut - Ruth Quayle
- The Sea of Stories - Sylvia Bishop
- The Princess and the Pea (*How could we help the Princess go to sleep with fewer mattresses?*)
- Hansel and Gretel (Are sweets a good option to build a house?)

Year Three

Y3 - Animals including humans.

Content

Children will learn about the importance of nutrition and will be introduced to the main body parts associated with the skeleton and muscles.

Terminology

skeleton, muscles, joint, cartilage, tendon, pelvis, rib cage, spine

Scientific Enquiry

- Identifying and grouping animals with and without skeletons (**grouping and classifying**)
- “What nutrients does our body need?” (**researching using secondary sources**)
- “Does doing lots of sports make you fitter?” (**pattern seeking**)
- “Do male humans have larger skulls than female humans?” (**pattern seeking**)

Y3 - Plants

Content

Children will learn the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. They will be taught about 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 and they will explore the part that flowers play in the life cycle of flowering plants.

Terminology

nutrients, pollination, seed formation, seed dispersal

Scientific Enquiry

- “How is water transported in plants?” Putting cut up flowers/ lettuce into coloured water and observing transportation of water (**observation**)
- “Do bigger plants grow from bigger seeds?” (**pattern seeking**)
- *What colour flowers do pollinating insects prefer?* (**pattern seeking**)

Books

- The Animals of Farthing Wood - Colin Dann
- The Night Gardener - Terry Fan
- Tom’s Midnight Garden - Philliipa Pearce
- The Last Tree - Emily Haworth Boot

Y3 - Rocks

Content

Children will compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. They will learn to describe in simple terms how fossils are formed.

Terminology

fossil, soil, crystal, sedimentary, metamorphic, igneous.

Scientific Enquiries

- Classifying rocks according to whether they have grains or crystals (**grouping and classifying**)
- “How are fossils formed?” (**researching using secondary sources**)

Books:

- Ballet Shoes (fossil connections) - Noel Streatfield
- The Street Beneath my Feet - Charlotte Guillian

Y3- Light

Content

Children will learn that they need light in order to see things and that dark is the absence of light. They will explore the reflection of light and formation of shadows. They will be taught about the importance of protecting their eyes from bright lights.

Terminology

light source, reflection, refraction, shadows, periscope.

Scientific Enquiries

- Which pair of sunglasses is most effective? (**comparative test**)
- What happens to shadows when the light source moves? (**pattern seeking**)

Books

- Orion and the Dark - Emma Yarlett
- Peter Pan - J.M. Barrie
- The Little Match Girl - Hans Christian Andersen

Y3- Forces and magnets

Content

Children will explore the attraction and repelling of magnets. They will observe how magnets attract or repel each other and materials and compare how objects move on different surfaces.

Terminology

attract, repel, magnetic pole, friction, poles, push, pull

Scientific Enquiries

- Which shoe/ surface is the most slippery? (**comparative test**)
- If I change the car, what happens to the distance travelled? (**comparative test**)

Books

- The Iron Man - Ted Hughes
- The Tin Snail - Cameron McAllister

Year Four

Y4 - Animals Including Humans

Content

Children will be introduced to the main body parts associated with the digestive system. They will be taught to identify the different types of teeth in humans and their simple functions. They will learn to construct and interpret a variety of food chains, identifying **producers, predators** and **prey**.

Terminology

predators, prey, producers, organ, molars, canines, incisors, oesophagus, stomach, small intestine, large intestine, pancreas

Scientific Enquiries

- Which liquid decays our teeth the most? Eggs in liquid investigation (**comparative test**)
- Grouping and classifying the teeth of carnivores and herbivores (**grouping and classifying**)
- Are foods that are high in energy always high in sugar? (**pattern seeking**)

Books

- Watership Down (food chains)- Richard Adams
- The Incredible Journey (food chains) - Sheila Burnford
- The Incredible Book-Eating Boy - Oliver Jeffers

Y4 - Living things and their habitats

Content

Children will identify habitat changes throughout the year. They will explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. Children will explore examples of human impact (both positive and negative) on environments: the positive effects of **nature reserves**, ecologically planned parks, or garden ponds, and the negative effects of **population and development, litter or deforestation**.

Terminology

vertebrate, invertebrate, deforestation, flowering, non-flowering, organism

Scientific Enquiries

- using and making simple guides or keys to explore and identify local plants and animals (**researching using secondary sources**)
- grouping plants and animals in environment (**identifying and classifying**)
- researching the effects of deforestation (**researching using secondary sources**)

Books

- Wolves - Emily Gravet
- The clue is in the poo (links to habitats) - Andy Seed
- The promise - Nicola Davies
- This is Just to Say - Carlos Williams
- Blackberry eating - Galway Kinnell
- After Apple Picking – Robert Frost
- The Incredible Journey - Shelia Burnford

Y4 - Sound

Content

Children will explore and identify the way sound is made through vibration. They will be introduced to the terms **pitch** and **volume** and explore these in a range of objects and instruments. Children will learn that vibrations from sounds travel through a medium to the ear.

Terminology

source, pitch, volume, vibration, frequency, outer, middle and inner ear, cochlea, hammer, auditory nerve, insulation

Scientific Enquiries

- “Which milk bottle makes the highest pitch sound?” (**pattern seeking**)
- “Which material makes the best ear-muffs?” (**comparative test**)

Books

- The Pied Piper – Emma Chicester Clark
- Julia Donaldson - Poems to perform
- Peter and the Wolf - Sergei Prokofiev
- Sleeping Beauty (What could penetrate the walls of the castle?)
- Rain dance poem - Victoria Reome
- Cynthia in the Snow - Gwendolyn Brookes

Y4 - Electricity

Content

Children will construct a simple series electrical circuit, identifying and naming its basic parts. Pupils should draw the circuit as a pictorial representation, not necessarily using conventional circuit symbols.

Terminology

electricity, appliance, battery, cell, power, wires, bulbs, switches, buzzers, conductor, insulator

Scientific Enquiries

- Testing whether different materials conduct electricity (**pattern spotting**)
- What happens when we add more bulbs to a circuit (**pattern spotting**)

Y4 - States of Matter

Content

Children will explore a variety of everyday materials and develop simple descriptions of the states of matter. They will observe materials changing state through heating or cooling, and measure or research the temperature at which this happens. They will identify the part played by evaporation and condensation in the water cycle.

Terminology

matter, solid, liquid, gas, freezing, melting, water vapour, condensation, precipitation, evaporation, transpiration

Scientific Enquiries

- Place ice cubes in a glass, observe and discuss what happens (**observation over time**)
- *Which type of chocolate melts the quickest?* (**fair test enquiry**)
- Grouping and classifying materials as solids, liquids or gases
- Record and measure the evaporation of a beaker of water over 2 weeks (**observation over time**)
- *How does the surface area of a container of water affect how long it takes to evaporate?* (**fair test**)

Books

- The Rhythm of the Rain - Grahame Baker Smith
- Swallows and Amazons - Arthur Ransome
- Once Upon A Raindrop - James Carter
- The Tempest - William Shakespeare
- Rivers: A Visual History from River to Sea

Year Five

Y5 - Animals including habitats

Content

Children will learn about the stages in the growth and development of humans. They will be taught the changes experienced in puberty.

Terminology

puberty, gestation, classification, reproduction, teenager, obese, toddler, embryo

Scientific Enquiries

- researching the gestation periods of other animals (**researching using secondary sources**)
- recording the length and mass of a baby as it grows (**researching using secondary sources**)
- *Is there a link between a mammal's size and the length of its gestation period?* (**pattern seeking**)

Books

- The Nowhere Emporium (link to human lifecycles)- Ross Mackenzie
- The 1000-Year-Old Boy - Ross Welford
- The Last Wild - Piers Torday
- Tarka the Otter - Henry Williamson

Y5 - Living things and their habitats

Content

Children will learn to describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. They will be taught about different types of reproduction, including sexual and asexual reproduction in plants, and sexual reproduction in animals. They will find out about the work of naturalists and animal behaviourists, for example, David Attenborough and Jane Goodall.

Terminology

sexual reproduction, asexual reproduction, naturalist

Scientific Enquiries

- Growing plants from cuttings, tubers and bulbs (**observation over time**)
- Producing a biography about a naturalist (**researching using secondary sources**)
- Compare this collection of animals based on similarities and differences in their lifecycle. (**identifying, grouping and classifying**)

Books

- My Family and Other Animals - Gerald Durrell
- A year of Nature Poems - Joseph Coelho
- The Lost Spells - Robert Macfarlane
- Lost Words - Robert Macfarlane

Y5 - Forces

Content

Children will explore falling objects and develop an understanding of **gravity** and **air resistance**. They will identify the effects of **air resistance**, **water resistance** and **friction**, that act between moving surfaces. Children will explore the effects of levers, pulleys and simple machines on movement.

Terminology

friction, gravity, air resistance, water resistance, levers, pulleys, gears, parachute, Newton

Scientific Enquiries

- Creating parachutes and investigating "How does the surface area of a parachute affect the time it takes to fall?" (**fair test**)

- Do all objects fall through water in the same way? (**pattern seeking**)
- How does the surface area of a container affect the time it takes to sink? (**fair test**)

Books

- The Man Who Walked Between The Towers – Mordicai Gerstein
- A Sailing Boat in the Sky - Quentin Blake
- The Princess and the Glass Mountain

Y5 - Earth and Space

Content

Children will learn to describe the movement of the Earth, and other planets, relative to the Sun in the solar system. They will be taught about the Earth's rotation and use this to explain day and night and the apparent movement of the sun across the sky.

Terminology

orbit, solar system, astronomy, planet, rotation, spherical, crescent moon, gibbous moon, eclipse, lunar

Scientific Enquiries

- Is there a pattern between the size of a planet and the time it takes to travel around the sun? (**pattern spotting**)
- researching evidence of life in space or Apollo missions (**researching using secondary sources**)

Books

- Cosmic – Frank Cottrell Boyce
- Balloon to the Moon - Gill Arbutnott

Y5 - Properties and changes of materials

Content

Children build a more systematic understanding of materials by exploring and comparing the properties of a broad range of materials, including relating these to what they learnt about magnetism in year 3 and about electricity in year 4. They will explore **reversible changes**, including, **evaporating, filtering, sieving, melting** and **dissolving**, recognising that melting and dissolving are different processes. They will also explore irreversible changes and find out about how chemists create new materials.

Terminology

solubility, soluble, insoluble, dissolve, conductivity, filtering, separate, reversible, irreversible

Scientific Enquiries

- "Which nappy is the most absorbent?" (**fair test**)
- Which materials would be the most effective for making a warm jacket, for wrapping ice cream to stop it melting, or for making blackout curtains? (**comparative test**)
- Grouping objects into transparent, translucent and opaque materials (**identifying, grouping and classifying**)

Books

- George's Marvellous Medicines - Roald Dahl
- The Wizards of Once - Cressida Cowell

Year Six

Y6 - Animals including humans

Content

Children will learn the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. They will be taught about the impact of diet, exercise, drugs and lifestyle on the way their bodies function.

Terminology

circulatory system, veins, arteries, capillaries, heart rate, pulse, blood vessels, red blood cells, white blood cells, platelets, calories.

Scientific Enquiries

- Investigating and measuring pulse rate during exercise (**pattern seeking**)
- Conducting research about diet and drugs (**researching using secondary sources**)
- Investigating a Pig's heart (**researching using secondary sources**)

Books

- Pig Heart Boy - Malorie Blackman
- Fastest Boy in the World - Elizabeth Laird

Y6 - Living things and their habitats

Content

Children will learn that the classification system in more detail. They will classify living things and be introduced to the idea that broad groupings, such as micro-organisms, plants and animals can be subdivided.

Terminology

micro-organism, species, fungi, monera, bacteria, protista, algae

Scientific Enquiries

- Using keys and computer programmes to classify a range of living things (**grouping and classifying**)
- Research unfamiliar animals and plants and decide where they belong on a classification key. Researching the work of Carl Linnaeus. (**researching using secondary sources**)
- Do all flowers have the same number of petals? (**pattern spotting**)

Books

- The Children of the New Forest - Frederick Marryat
- Cayote Summer - Mimi Thebo
- The Dreamfighter and other Creation Tales - Ted Hughes
- Cats - T.S Elliot
- Tyger, Tyger- William Blake

Y6 - Evolution and inheritance

Content

Building on what they learned about fossils in the topic on rocks in year 3, children will find out more about how living things on earth have changed over time. They will be introduced to the idea that characteristics are passed from parents to their **offspring**. Children will develop an understanding that **variation** in offspring over time can make animals more or less able to survive in particular environments.

Terminology

inheritance, characteristics, variation, DNA, genes, adaptation, inheritance, palaeontologist, descendants

Scientific Enquiries

- Bird beak buffet - Are there any patterns between birds' beaks and the foods they eat? (**pattern spotting**)

- Compare the skeletons of apes, humans, and Neanderthals – how are they similar, and how are they different **(identifying, grouping and classifying)**
- Can you classify these observations into evidence for the idea of evolution, and evidence against? **(identifying, grouping and classifying)**

Books

- Wonder (Does everybody look the same?) - R.J Palacio
- Charles Darwin On the Origin of the Species - Sabina Radeva
- Harry Potter (explore magical inheritance)
- What Mr Darwin Saw - Mick Manning
- One Smart Fish - Chris Wormell

Y6 - Light

Content

Children will build on the work on light in year 3, exploring the way that light behaves, including light sources, reflection and shadows.

Terminology

light wave, concave, convex, filters, lens, retina, cornea, iris, pupil

Scientific Enquiries:

- Investigating the effect of different light sources and objects and the shadows produced **(comparative tests)**
- How do shadows change during the day? **(observation over time)**
- How does the angle that a light ray hits a plane mirror affect the angle at which it reflects off the surface? **(fair test)**

Books

- Walkabout - James Vance Marshall
- The White Darkness - David Grann

Y6 - Electricity

Content

Building on their work in year 4, children will construct simple series circuits, to help them to answer questions about what happens when they try different components, for example, switches, bulbs, buzzers and motors. They will learn how to represent a **simple circuit** in a diagram using **recognised symbols**.

Terminology

socket, parallel circuit, series circuit, volts, current, lux

Scientific Enquiries

- Systematically identifying the effect of changing one component at a time in a circuit **(fair testing)**
- How would you group electrical components and appliances based on what electricity makes them do? **(identifying, grouping and classifying)**

Books:

- Carrie's War - Nina Bawden
- Harry Potter - J.K Rowling