



Burbage Primary School's Science Curriculum

Intent:

'Inspiration, Community and Growth' underpin our vision; these words capture everything we strive for at Burbage Primary School. Our aim is to foster life-long learners who are active members of the community, locally and globally with growth mindsets to go beyond limited thinking.

At Burbage we are ambitious for all pupils to achieve their full potential through a carefully sequenced, broad and balanced curriculum. This is knowledge focused but also equips children with the necessary skills to succeed in life.

Science teaching at Burbage aims to give children a strong understanding of the world around them whilst acquiring specific skills and knowledge. Science is taught as Biology, Chemistry or Physics topics which are structured as series of key enquiry questions. These topics are revisited and developed throughout their time at school to ensure continuity and progression. Specialist vocabulary is introduced at the beginning of each topic and built up across each key stage and concepts are taught by focussing on the scientific enquiry questions. This allows children to build on their prior knowledge, increase engagement and enjoyment for further learning whilst embedding this knowledge into the long-term memory.

Scientific enquiry skills are embedded within each topic the children study to develop and use a range of skills including observation, planning and investigation to become independent learners in exploring possible answers to our key enquiry questions. Our aim is for all children to enjoy, engage and be curious of the world around them as active learners.

YEAR ONE

Animals including humans

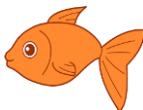
Children will learn to:

- 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)

They will use the local environment throughout the year to explore and answer questions about animals in their habitat.

They should understand how to take care of pets and animals taken from their local environment and the need to return them safely after study.

They will become familiar with the common names of some fish, amphibians, reptiles, birds and mammals, including those that are kept as pets.



Children may refine their scientific skills by:

- using their observations to compare and contrast animals at first hand or through videos and photographs, describing how they identify and group them
- grouping animals by what they eat.

Materials

Children will learn to:

- distinguish between an object and the material from which it is made
- identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock
- describe the simple physical properties of a variety of everyday materials
- compare and group together a variety of everyday materials based on their simple physical properties.

They will explore, name, ask and answer questions about everyday materials so that they become familiar with the names of materials and properties such as: hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/not waterproof; absorbent/not absorbent; opaque/transparent.

They will explore and experiment with a wide variety of materials, including brick, paper, fabrics, elastic, foil.

Children may refine their scientific skills by:

- performing simple tests to explore questions, for example: 'What is the best material for an umbrella? ...for lining a dog basket? ...for curtains? ...for a bookshelf? ...for a gymnast's leotard?'



Seasonal Change

Children will learn to:

- observe changes across the four seasons
- observe and describe weather associated with the seasons and how day length varies

They will observe and talk about changes in the weather and the seasons.

Children may refine their scientific skills by:

- making tables and charts about the weather; making displays of what happens in the world around them, including day length, as the seasons change



Plants

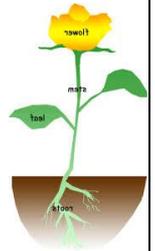
Children will learn to:

- 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.

They will use the local environment throughout the year to explore and answer questions about plants growing in their habitat.

Where possible, they will observe the growth of flowers and vegetables that they have planted.

They should become familiar with common names of flowers, examples of deciduous and evergreen trees, and plant structures (including leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, stem).



Children may refine their scientific skills by:

- observing closely, perhaps using magnifying glasses, and comparing and contrasting familiar plants;
- describing how they could identify and group them, and drawing diagrams showing the parts of different plants including trees.
- keeping records of how plants have changed over time, e.g. the leaves falling off trees and buds opening; and compare what they have found out about different plants.

YEAR TWO

Living things and their habitats (micro-habitats)

Children will learn to:

- 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 the basic needs of different kinds of animals and plants, and how they depend on each other
- identify and name a variety of plants and animals in their habitats, including microhabitats
- describe how animals obtain their food from plants and other animals, using the idea of simple food chains, and identify and name different sources of food.

They will be introduced to the idea that all living things have characteristics that are essential for keeping them alive and healthy and will become familiar with the life processes that are common to all living things.

Children will be introduced to the terms 'habitat' (a natural environment or home of a variety of plants and animals) and 'micro-habitat' (a very small habitat, for example for woodlice under stones, logs or leaf litter).

They will ask and answer questions about their local environment to identify and study a variety of plants and animals and observe how living things depend on each other, e.g. plants serving as a source of food and shelter for animals.

They will compare animals in familiar habitats with those in less familiar habitats, e.g. on the seashore, in woodland, in the ocean, in the rainforest.

Children may refine their scientific skills by:

- sorting and classifying things by whether they are living, dead or were never alive, and recording their findings using charts.
- describing how they decided where to place things and talk about ways of answering their questions.
- constructing simple food chains to include humans (e.g. grass, cow, human).

Materials- Uses of everyday materials

Children will learn to:

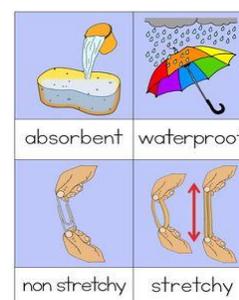
- identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses
- find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.



They 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 (metal can be used for coins, cans, cars and table legs; wood can be used for matches, floors, and telegraph poles) or how different materials are used for the same thing (spoons can be made from plastic, wood, metal, but not normally from glass).

They will think about the properties of materials that make them suitable or unsuitable for a particular purpose and they should be encouraged to think about unusual and creative uses for everyday materials.

Children may find out about people who have developed useful new materials, for example John Dunlop, Charles Macintosh or John McAdam.



Children may refine their scientific skills by:

- comparing the uses of everyday materials in and around the school with materials found in other places (at home, the journey to school, on visits, and in stories, rhymes and songs);
- observing closely,

- **describing the conditions in different habitats and micro-habitats (under log, on stony path, under bushes) and find out how these conditions affect the number and type(s) of plants and animals that live there.**

- **identifying and classifying the uses of different materials,**
- **recording their observations.**

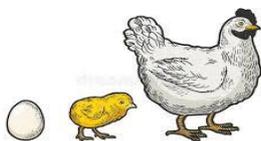
Animals including humans

Children will learn to:

- **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.**

They will be introduced to the basic needs of animals for survival, as well as the importance of exercise and nutrition for humans.

They will also be introduced to the processes of reproduction and growth in animals. The focus will be on questions that help pupils to recognise growth (they should not be expected to understand how reproduction occurs). The following examples might be used: egg, chick, chicken; egg, caterpillar, pupa, butterfly; spawn, tadpole, frog; lamb, sheep. Growing into adults can include reference to baby, toddler, child, teenager, adult.



Children may refine their scientific skills by:

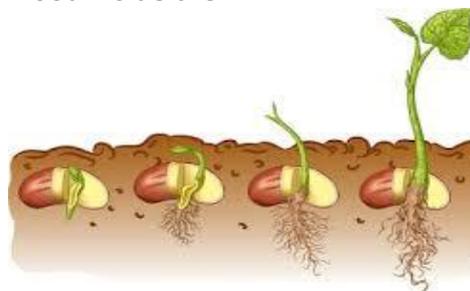
- **observing, through video or first-hand observation and measurement, how different animals including humans, grow;**
- **asking questions about what things animals need for survival and what humans need to stay healthy;**
- **suggesting ways to find answers to their questions**

Plants

Children will learn to:

- **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**
- **explore and compare the differences between things that are living, dead, and things that have never been alive**

They will use the local environment throughout the year to observe how different plants grow and be introduced to the requirements of plants for germination, growth and survival, as well as to the processes of reproduction and growth in plants. Note: Seeds and bulbs need water to grow but most do not need light; seeds and bulbs have a store of food inside them.



Children may refine their scientific skills by:

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

YEAR THREE

Animals including humans (muscles, skeleton and nutrition)

Children will learn to:

- identify that humans and some other animals have skeletons and muscles for support, protection and movement.
- 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



They will be introduced to the main body parts associated with the skeleton and muscles, finding out how different parts of the body have special functions.

They will continue to learn about the importance of nutrition.

Children may refine their scientific skills by:

- comparing the diets of different animals (including their pets) and deciding ways of grouping them by what they eat.
- researching different food groups and how they keep us healthy and designing meals based on what they find out.
- identifying and grouping animals with and without skeletons and observing and comparing their movement; exploring ideas about what would happen if humans did not have skeletons



Materials – Rocks

Children will learn to:

- compare and group different kinds of rocks based on their appearance and simple physical properties
- describe in simple terms how fossils are formed when things that have lived are trapped within rock
- recognise that soils are made from rocks and organic matter.

Linked with work in geography, children will explore different kinds of rocks and soils, including those in the local environment.

Children may refine their scientific skills by:

- observing rocks, including those used in buildings and gravestones, and exploring how and why they might have changed over time
- using a hand lens or microscope to help identify and classify rocks by whether they have grains or crystals, and whether they have fossils in them.
- researching and discussing the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed.
- exploring different soils and identifying similarities and differences between them and investigating what happens when rocks are rubbed together or what changes occur when they are in water.
- ask and answer questions about the way soils are formed.



Forces and Magnets

Plants

Children will learn to:

- 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)

Children will learn to:

- compare how things move on different surfaces
- notice that some forces need contact between two objects, but magnetic forces can act at a distance
- observe how magnets attract or repel each other and attract some materials and not others
- compare and group together a variety of everyday materials by whether they are attracted to a magnet, and identify some magnetic materials
- describe magnets as having two poles
- predict whether two magnets will attract or repel each other, depending on which poles are facing.



They will observe that magnetic forces can act without direct contact, unlike most forces, where direct contact is necessary (for example, opening a door, pushing a swing).

They should explore the behaviour and everyday uses of different magnets (e.g. bar, horseshoe).

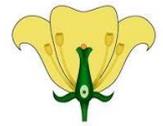
Children may refine their scientific skills by:

- comparing how different things move and grouping them;
- raising questions and testing to find out how far things move on different surfaces
- exploring strengths of different magnets and finding a fair way to compare them;
- sorting materials into those that are magnetic and those that are not;
- looking for patterns in the way that magnets behave in relation to each other for example, the strength of the magnet or which pole faces another;
- identifying how these properties make magnets useful in everyday items and suggesting uses for different magnets.

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.

They will be introduced to the relationship between structure and function: the idea that every part has a job to do.

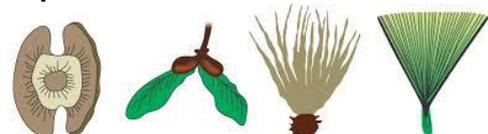


They will explore the role of the roots and stem in nutrition and support, leaves for nutrition and flowers for reproduction.

They can be introduced to the idea that plants can make their own food

Children may refine their scientific skills by:

- comparing the effect of different factors on plant growth, for example, the amount of light, the amount of fertiliser;
- discovering how seeds are formed by observing the different stages of plant life cycles over a period of time;
- looking for patterns in the structure of fruits that relate to how the seeds are dispersed.



- observing how water is transported in plants, for example, by putting cut, white carnations into coloured water and observing how water travels up the stem to the flowers

Light

Children will learn to:

- recognise that they need light in order to see things and that dark is the absence of light
- notice that light is reflected from surfaces
- recognise that light from the sun can be dangerous and that there are ways to protect their eyes
- recognise that shadows are formed when the light from a light source is blocked by an opaque object



- **find patterns in the way that the size of shadows change.**

They will explore what happens when light reflects off a mirror or other reflective surfaces, to answer questions about how light behaves. They should think about why it is important to protect their eyes from bright lights. They will measure, shadows, and find out how they are formed and what might cause them to change

Children may refine their scientific skills by:

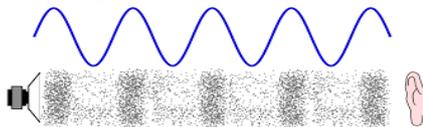
- **looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes.**

YEAR FOUR

Sound

Children will learn to:

- **identify how sounds are made, associating some of them with something vibrating**
- **recognise that vibrations from sounds travel through a medium to the ear**



- **find patterns between the pitch of a sound and features of the object that produced it**
- **find patterns between the volume of a sound and the strength of the vibrations that produced it**
- **recognise that sounds get fainter as the distance from the sound source increases.**

They will explore and identify the way sound is made through vibration in a range of different musical instruments and find out how the pitch and volume of sounds can be changed in a variety of ways.

Children refine



may their

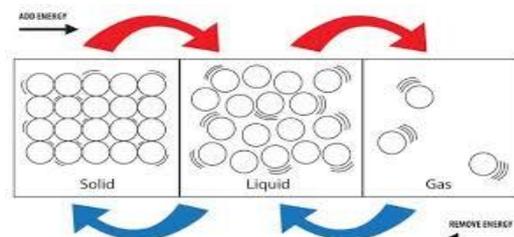
scientific skills by:

- **finding patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses.**
- **making earmuffs from a variety of different materials to investigate which provides the best insulation against sound.**

Materials- States of matter

Children will learn to:

- **compare and group materials according to whether they are solids, liquids or gases**
- **observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)**
- **identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.**



They will explore a variety of everyday materials and develop simple descriptions of the states of matter (solids hold their shape; liquids form a pool not a pile; gases escape from unsealed containers). Pupils should observe water as a solid, a liquid and a gas and should note the changes to water when it is heated or cooled.

Children may refine their scientific skills by:

- **grouping and classifying a variety of different materials;**
- **exploring the effect of temperature on substances such as chocolate, butter, cream (for example, to make food such as chocolate crispy cakes and ice cream for a party).**
- **researching the temperature at which materials change state e.g. when iron**

- making and playing their own instruments by using what they have found out about pitch and volume

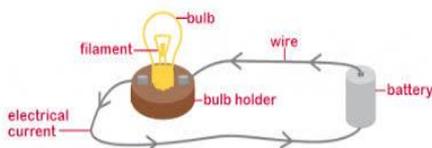
melts or when oxygen condenses into a liquid.

- observing and recording evaporation over time, (a puddle in the playground) and investigate the effect of temperature on washing drying or snow melting.

Electricity

Children will learn to:

- identify common appliances that run on electricity
- construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers
- identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery
- recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit
- recognise some common conductors and insulators, and associate metals with being good conductors.



They will construct simple series circuits, trying different components, e.g. bulbs, buzzers, motors and switches, and use their circuits to create simple devices. They will draw the circuit as a pictorial representation, (conventional circuit symbols will be introduced in year 6)

Children will be taught about precautions for working safely with electricity.

Children may refine their scientific skills by: observing patterns,

- that bulbs get brighter if more cells are added,
- that metals tend to be conductors of electricity,
- that some materials can and some cannot be used to connect across a gap in a circuit.



Danger
Electricity

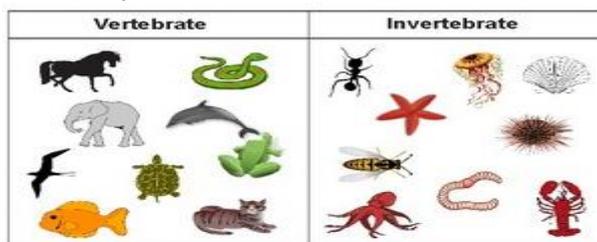
Living things and their habitats

Children will learn to:

- 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.

They will use the local environment to raise and answer questions that help them identify and study plants and animals in their habitat. They will identify how the habitat changes throughout the year and explore possible ways of grouping a wide selection of living things that include animals and flowering plants and nonflowering plants.

Children will begin to put vertebrate animals into groups such as fish, amphibians, reptiles, birds, and mammals; and invertebrates into snails and slugs, worms, spiders, and insects.



Plants can be grouped into categories such as flowering plants (including grasses) and non-flowering plants (ferns and mosses).

They will explore examples of human impact (both positive and negative) on environments, e.g. the positive effects of nature reserves, ecologically planned parks, or garden ponds, and the negative effects of population and development, litter or deforestation.

Children may refine their scientific skills by:

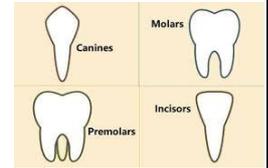
- using and making simple guides or keys to explore and identify local plants and animals;
- making a guide to local living things;

- raising and answering questions based on their observations of animals and other animals that they have researched.

Animals including humans (teeth and digestion and food chains)

Children will learn to:

- 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



They will be introduced to the main body parts associated with the digestive system, for example, mouth, tongue, teeth, oesophagus, stomach and small and large intestine and explore questions that help them to understand their special functions.

Children may refine their scientific skills by:

- comparing the teeth of carnivores and herbivores, and suggesting reasons for differences;
- finding out what damages teeth and how to look after them.
- draw/discuss their ideas about the digestive system and compare them with models or images

YEAR FIVE

Earth and Space

Children will learn to:

- describe the movement of the Earth, and other planets, relative to the Sun in the solar system
- describe the movement of the Moon relative to the Earth
- describe the Sun, Earth and Moon as approximately spherical bodies
- use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.

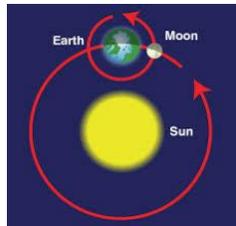
Pupils should be introduced to a model of the Sun and Earth that enables them to explain day and night.

Pupils should learn that the Sun is a star at the centre of our solar system and that it has eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune (Pluto was reclassified as a 'dwarf planet' in 2006).

They should understand that a moon is a celestial body that orbits a planet (Earth has one moon; Jupiter has 4 large moons and many smaller ones). Pupils should find out about the way that ideas about the solar system have developed, understanding how the geocentric model of the solar system gave way to the heliocentric model by considering the work of scientists like Copernicus.

Children may refine their scientific skills by:

- comparing the time of day at different places on the Earth through internet links and direct communication;
- creating simple models of the solar system;



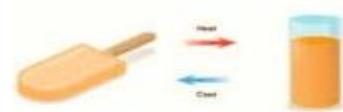
Materials

(Properties and changes of materials)

Children will learn to:

- compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets
- know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution
- use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating
- give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic
- demonstrate that dissolving, mixing and changes of state are reversible changes

Reversible change



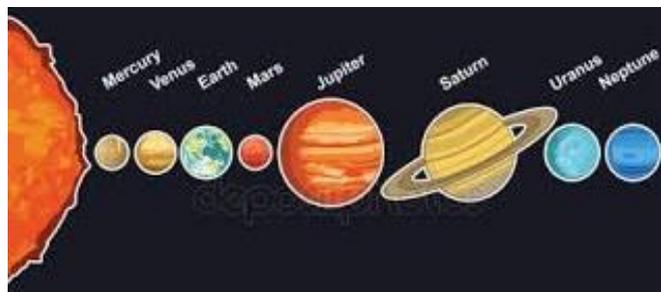
- explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.

Irreversible change



They will build a more systematic understanding of materials by exploring and comparing the properties of a broad range of materials, relating

- **constructing simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day;**
- **finding out why some people think that structures such as Stonehenge might have been used as astronomical clocks.**



what they learnt about magnetism in year 3 and about electricity in year 4.

They should explore reversible changes, including, evaporating, filtering, sieving, melting and dissolving, recognising that melting and dissolving are different processes. They will explore changes that are difficult to reverse, for example, burning, rusting and other reactions, for example, vinegar with bicarbonate of soda.

They will find out about how chemists create new materials, for example, Spencer Silver, who invented the glue for sticky notes or Ruth Benerito, who invented wrinkle-free cotton.

Children may refine their scientific skills by:

- **carrying out tests to answer questions, for example, '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?'**
- **comparing materials to make a switch in a circuit.**
- **observing and compare the changes that take place, for example, when burning different materials or baking bread**
- **researching and discussing how chemical changes have an impact on our lives, for example, in cooking, the creative use of new materials such as polymers, super-sticky and super-thin materials.**

Living things and their habitats

Children will learn to:

- **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.**

They will study and raise questions about their local environment throughout the year. They will observe life-cycles in a variety of living things, for example, plants in the vegetable garden or flower border, and animals in the local environment.

They will find out about the work of naturalists and animal behaviourists, for example, David Attenborough and Jane Goodall.

Children will find out about different types of reproduction, including sexual and asexual reproduction in plants, and sexual reproduction in animals.

Forces

Children will learn to:

- **explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object**
- **identify the effects of air resistance, water resistance and friction, that act between moving surfaces**
- **recognise that some mechanisms, including levers, pulleys and gears, allow smaller force to have a greater effect.**



They will explore falling objects and raise questions about the effects of air resistance and will explore the effects of air resistance by observing how different objects such as parachutes and sycamore seeds fall. They will experience forces that make things begin to move, get faster or slow down.

Children may refine their scientific skills by:

- observing and comparing the life cycles of plants and animals in their local environment with other plants and animals (in the rainforest, in the oceans, in desert areas and in prehistoric times), asking pertinent questions and suggesting reasons for similarities and differences.



- trying to grow new plants from different parts of the parent plant, for example, seeds, stem/root cuttings, tubers, bulbs.
- observing changes in an animal over a period of time (by hatching and rearing chicks), comparing how different animals reproduce and grow.

They will explore the effects of friction on movement and find out how it slows or stops moving objects, for example, by observing the effects of a brake on a bicycle wheel.

They will explore the effects of levers, pulleys and simple machines on movement.

Children will find out how scientists Galileo Galilei and Isaac Newton helped to develop the theory of gravitation.



Children may refine their scientific skills by:

- exploring falling paper cones or cupcake cases
- designing and making a variety of parachutes and carrying out fair tests to determine which designs are the most effective.
- exploring resistance in water by making and testing boats of different shapes.
- designing and making products that use levers, pulleys, gears and/or springs.

Animals including humans

Children will learn to:

- describe the changes as humans develop to old age.



Children will draw a timeline to indicate stages in the growth and development of humans.
(they will learn about the changes experienced in puberty in Year 6 PSHE curriculum)

Children may refine their scientific skills by:

- researching the gestation periods of other animals and comparing them with humans
- finding out and recording the length and mass of a baby as it grows.

YEAR SIX

Electricity

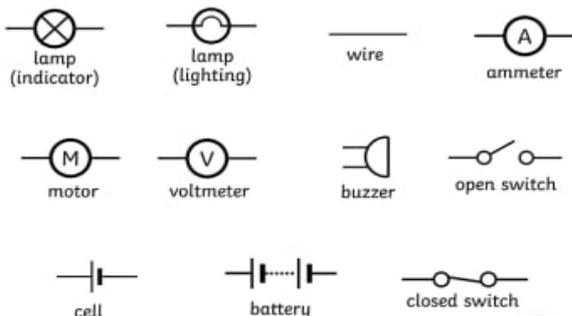
Children will learn to:

- associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit
- compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches
- use recognised symbols when representing a simple circuit in a diagram.

Building on their work in year 4, they 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.

They will be taught to take the necessary precautions for working safely with electricity.

Electrical Circuit Symbols



Children may refine their scientific skills by:

Evolution and Inheritance

Children will learn to:

- 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.

Building on what they learned about fossils 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, by considering different breeds of dogs, and what happens when, for example, labradors are crossed with poodles.

Children will appreciate that variation in offspring over time can make animals more or less able to survive in particular environments, for example, the development of insulating fur on the arctic fox. Children will find out about the work of palaeontologist Mary Anning and about how Charles Darwin and Alfred Wallace developed their ideas on evolution.

Children may refine their scientific skills by:

- observing and raising questions about local animals and how they are adapted to their environment;
- comparing how some living things are

- systematically identifying the effect of changing one component at a time in a circuit;
- designing and making a set of traffic lights, a burglar alarm or some other useful circuit.

- adapted to survive in extreme conditions, for example, cactuses, penguins and camels.
- analysing the advantages and disadvantages of specific adaptations, such as being on two feet rather than four, having a long or a short beak, tendrils on climbing plants or brightly coloured and scented flowers.

Living things and their habitats

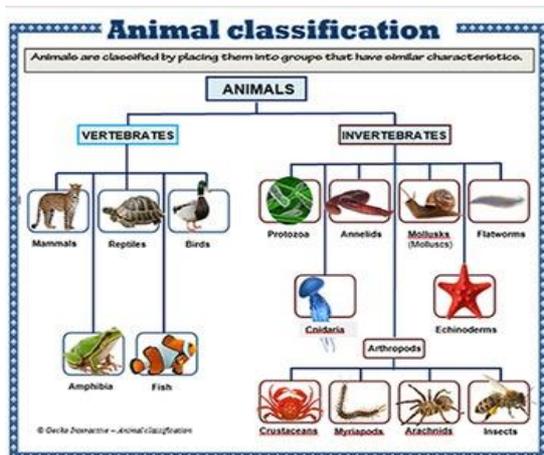
Children will learn to:

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

They will build on their learning about grouping living things in year 4 by looking at the classification system in more detail. Children will be introduced to the idea that broad groupings, such as microorganisms, plants and animals can be subdivided.

Through direct observations where possible, they will classify animals into commonly found invertebrates (such as insects, spiders, snails, worms) and vertebrates (fish, amphibians, reptiles, birds and mammals) and will discuss reasons why living things are placed in one group and not another.

Children will find out about the significance of the work of scientists such as Carl Linnaeus, a pioneer of classification.



Light

Children will learn to:

- recognise that light appears to travel in straight lines
- use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye
- explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes
- use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.



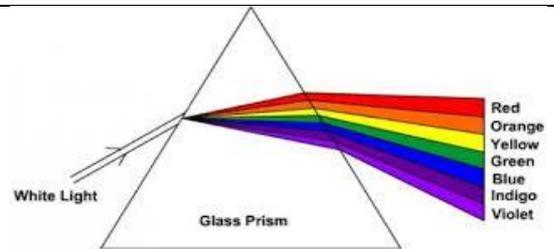
They will build on the work on light in year 3, exploring the way that light behaves, including light sources, reflection and shadows.

Children may refine their scientific skills by:

- deciding where to place rear-view mirrors on cars;
- designing and making a periscope and using the idea that light appears to travel in straight lines to explain how it works.
- investigating the relationship between light sources, objects and shadows by using shadow puppets.
- looking a range of phenomena including rainbows, colours on soap bubbles, objects looking bent in water and coloured filters.

Children may refine their scientific skills by:

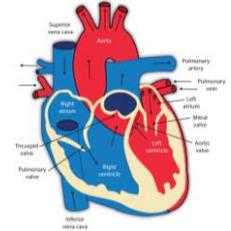
- using classification systems and keys to identify some animals and plants in the immediate environment.
- researching unfamiliar animals and plants from a broad range of other habitats and decide where they belong in the classification system.



Animals including humans

Children will learn to:

- 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.



They will build on their learning from years 3 and 4 about the main body parts and internal organs (skeletal, muscular and digestive system) to explore and answer questions that help them to understand how the circulatory system enables the body to function.

They will learn how to keep their bodies healthy and how their bodies might be damaged – including how some drugs and other substances can be harmful to the human body.

Children may refine their scientific skills by:

- exploring the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health.