

Year 1 Autumn 1: Plants

Strand: Biology

Main ideas:

Pupils learn to identify a variety of common and wild plants. They learn about different types of trees, as well as the structure of a flowering plant.

Pupils will build upon this knowledge in Year 2 and Year 3.

National Curriculum Knowledge:

- 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

Year 1 Autumn 1: Weather and Seasons

Strand: Physics

Main ideas:

Pupils look at the changes that occur across the four seasons, focussing on the weather which may be observed during these times. Teaching this unit at this point allows students to observe the seasons in real time for themselves during their time in year 1.

National Curriculum Knowledge:

- observe changes across the 4 seasons
- observe and describe weather associated with the seasons and how day length varies

Year 1 Spring 2: Materials (Everyday materials)

Strand: Chemistry

Main ideas:

Pupils explore everyday materials whereby they discover how to distinguish between an object and the material that it is made from. They learn to describe simple physical properties of everyday materials, as well as grouping together a variety of materials based on their properties.

This content leads directly into the year 2 unit 'Uses of Materials', and then subsequent 'Materials' units across KS2.

National Curriculum Knowledge:

- 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 on the basis of their simple physical properties

Year 1 Summer 1: Animals including humans (Common animals)

Strand: Biology

Main ideas:

Pupils learn to identify and draw parts of the human body.

Pupils also learn to identify a variety of common animals and learn to distinguish between carnivores, omnivores, and herbivores.

'Animals including humans' is a unit which runs throughout the children's time in primary school. They will continue to look at this unit in Years 2, 3, 4, 5 and 6 where it will be introduced to them in a variety of different ways.

National Curriculum Knowledge:

- 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

Year 2 Autumn 1: Animals including humans (Basic needs for survival)

Strand: Biology

Main ideas:

Pupils learn about the fact that animals (including humans) have offspring. They learn about the basic needs of animals and humans and what they require to survive. Pupils also begin to learn about hygiene, exercise, and eating the correct types of foods.

Previous knowledge:

Previous knowledge from Year 1 includes identifying parts of the human body and learning about a variety of common animals.

National Curriculum Knowledge:

- 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

Year 2 Spring 1: Materials (Purpose of materials)

Strand: Chemistry

Main ideas:

Pupils compare different materials and investigate why different materials are suited for different purposes. They look at how the shape of an object can be changed by squashing, bending, twisting and stretching.

Previous knowledge:

This unit follows on from the Year 1 unit whereby students learned to distinguish between materials. Pupils will continue to look more into properties of materials in Year 5.

National Curriculum Knowledge:

- 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

Year 2 Summer 1: Living things and their habitats (Habitats)

Strand: Biology

Main ideas:

Pupils learn the difference between things which are alive, dead and things which have never been alive. They learn about habitats (a natural environment or home of a variety of plants and animals), and the different habitats that exist, learning also about why certain habitats suit certain organisms. They also learn about simple food chains.

National Curriculum Knowledge:

- 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. Describe how different habitats provide for the basic

<p>Previous knowledge: In Year 1, children learn how to classify animals based on their characteristics and whether they are carnivores, omnivores. or herbivores. This unit expands upon that. This is the main chance for students to learn about habitats, however the knowledge and information obtained will be utilised and expanded upon in future 'living things and their habitats' topics in Years 4, 5, and 6.</p>	<p>needs of different kinds of animals and plants, and how they depend on each other</p> <ul style="list-style-type: none"> • identify and name a variety of plants and animals in their habitats, including microhabitats • describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food
<p>Year 2 Summer 1: Plants (Bulbs and growth) Strand: Biology</p>	
<p>Main ideas: Pupils learn what plants need in order to survive and stay healthy. They discover the types of habitats that plants need to survive and they use their knowledge on food chains to consider how plants may fit into different food chains.</p> <p>Previous knowledge: This unit expands on pupils' Year 1 knowledge of common wild and garden plants. Pupils use their previously acquired knowledge on habitats to discover the role of plants in the food chain. Pupils will expand upon their plant knowledge in Year 3 where they will look further into a plant's basic needs for survival.</p>	<p>National Curriculum Knowledge:</p> <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
<p>Year 2 Summer 2: Living things and their habitats (Habitats) Strand: Biology</p>	
<p>Main ideas: This unit links to the 'Living things and their habitats' unit that Year 2 pupils study in Summer 1, but this time there is a marine theme. Pupils learn about sea creatures and consider the food chains that exist under the sea.</p> <p>Previous knowledge:</p>	<p>National Curriculum Knowledge:</p> <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. Describe how different habitats provide for the basic

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<p>Year 3 Autumn 1: Materials (Rocks) Strand: Chemistry</p>	
<p>Main ideas: Pupils are taught the difference between igneous, sedimentary, and metamorphic rocks – learning about their properties and how they form. They learn about how fossils form and link this to their topic on dinosaurs by considering how palaeontologists use fossils to uncover the past.</p> <p>Previous knowledge: This unit is the sole unit taught on rocks and fossils; however, it follows on from the Year 1 and Year 2 'Materials' topics whereby students learned about the properties of materials. Students therefore use this base knowledge and apply it to their new learning on rocks and soil. Pupils will learn more about the properties of materials in Year 5.</p>	<p>National Curriculum Knowledge:</p> <ul style="list-style-type: none"> • compare and group together different kinds of rocks on the basis of 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
<p>Year 3 Spring 2: Light Strand: Physics</p>	
<p>Main ideas: Pupils learn about light and dark, and that shadows are formed when there is an absence of light due to the light source being blocked by an object. They learn that we see things when light from a light source is reflected off an object, and why certain objects appear to be certain colours.</p>	<p>National Curriculum Knowledge:</p> <ul style="list-style-type: none"> • recognise that they need light in order to see things and that dark is the absence of light

<p>Previous knowledge: This is the first time that the children have learned about light, however they will expand upon and develop their knowledge in Year 6 when they have a unit on 'Light and Electricity'.</p>	<ul style="list-style-type: none"> • 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~
<p>Year 3 Spring 2: Forces and magnets Strand: Physics</p>	
<p>Main ideas: Pupils look at magnets and learn the terms 'north pole' and 'south pole' to explain the two poles of a magnet. They learn how to explain whether magnets will attract or repel each other based on the way that these poles are facing. With this, pupils also learn about which materials are magnetic, and learn about the fact that the earth is just a giant magnet! Pupils learn about how objects move on different surfaces. They learn about friction, gravity and air resistance and how these forces impact an object's movement – using Isaac Newton's 3 laws of motion to explain this.</p> <p>Previous knowledge: This is the first time that students have looked into forces and magnets, but there is another unit on forces in Year 5 where pupils look into forces in much greater depth.</p>	<p>National Curriculum Knowledge:</p> <ul style="list-style-type: none"> • compare how things move on different surfaces • notice that some forces need contact between 2 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 on the basis of whether they are attracted to a magnet, and identify some magnetic materials • describe magnets as having 2 poles • predict whether 2 magnets will attract or repel each other, depending on which poles are facing
<p>Year 3 Summer 1: Plants (Basic needs for survival) Strand: Biology</p>	
<p>Main ideas: Students should already be aware of what a plant needs to grow and survive, and so in this unit, they develop upon that knowledge and learn in more detail about how the plant obtains its nutrients – including how water travels within a plant. Students learn about the life cycle of a plant; focusing on how plants are pollinated and why the life cycle is important.</p>	<p>National Curriculum Knowledge:</p> <ul style="list-style-type: none"> • identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers

Previous knowledge:

This unit builds on the knowledge gained by students in Year 1 and Year 2 where they learned the basic structure of a flowering plant as well as what a plant needs in order to survive. This is the last unit in the primary curriculum whereby plants are explicitly taught to students.

- 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

Year 3 Summer 2: Animals including humans (Skeletons and muscles)
 Strand: Biology

Main ideas:

Pupils learn about the skeletal system and the important role that it plays in the human body. Pupils learn about how skeletons and muscles are used for support, movement and protection.

Pupils consider the nutritional value of different food types and learn to distinguish between the different food groups. Pupils learn that a healthy diet is all about balance and that as humans, we obtain our nutrition from the food that we eat.

Previous knowledge:

This is the only unit whereby children learn about skeletons and muscles explicitly, however the unit is preceded by the Year 1 and 2 units where students learn about a human’s basic needs for survival. After this, pupils will continue to look at the human body and will learn about digestion and teeth in Year 4, growing and changing in Year 5, and the circulatory system in Year 6.

National Curriculum Knowledge:

- 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

Year 4 Autumn 2: Sound
Strand: Physics

Main ideas:

In this unit, pupils learn about the pitch, volume and frequency of sound. They discover that sound is the result of vibrations travelling through media to the ear and consider what may affect the volume and/or pitch of a sound.

Previous knowledge:

Sound is only explicitly taught one time in Primary school, and that is in Year 4. Pupils will consider how sound travels, particularly through different mediums, and this will support the learning that they do in Spring 1 whereby they learn about states of matter

National Curriculum Knowledge:

- 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

Year 4 Spring 1: Materials (States of matter)
Strand: Chemistry

Main ideas:

Pupils learn about the properties of materials and continue to look at the states: solid, liquid, and gas. They also learn that a substance may change from one state to another depending on the temperature, and learn about how and why this is possible. They learn about the concept of dissolving and discover which materials will and will not dissolve in water to form a solution. They will also learn about reversible reactions, and how they may be able to get the material back once it has formed a solution, as well as learning about irreversible change.

Previous knowledge:

Pupils learned about materials in Years 1 and 2 and they completed their materials module on 'rocks' in Year 3. They will continue to learn about states of matter in Year 5.

National Curriculum Knowledge:

- compare and group materials together, 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

Year 4 Spring 2: Electricity

Strand: Physics

Main ideas:

Pupils learn to create a simple, functioning circuit; they learn to name its basic parts, and how to draw a scientific circuit. Pupils also learn how to tell whether a light bulb in a circuit will light up, and the impact that a switch can have on a circuit. Pupils learn about which common everyday appliances use electricity, and also which can run on a battery. Pupils also learn about conductors and insulators.

Previous knowledge:

This is the first time that pupils have been taught electricity, however they will build further upon this knowledge in Year 6.

National Curriculum Knowledge:

- 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

Year 4 Summer 2: Living things and their habitats (Conservation/Classification)

Strand: Biology

Main ideas:

In this unit, pupils learn about living organisms and discover how these organisms can be grouped based on their similar characteristics. They learn to identify and name a variety of living things and consider the habitat that these living things live in. Pupils also look at how a change in a living thing's environment can be dangerous for them.

Previous knowledge:

Pupils have covered habitats already in Year 2 and have learned about conservation in Years 2 and 4. In Year 5, pupils will learn more about animals' life cycles and then in Year 6, they will continue learning about how living organisms may be classified.

National Curriculum Knowledge:

- 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

Year 4 Summer 2: Animals including humans (Digestive system)

Strand: Biology

Main ideas:

Pupils learn about human teeth – their names and their functions. They learn about the digestive system of a human and are taught how food travels through the human body.

Previous knowledge:

This is the only unit whereby pupils will have lessons explicitly on teeth and the digestive system, however pupils have previously learned about diet and nutrition when considering an animal's 'basic needs for survival' in Year 2, and a healthy diet in Year 3. Pupils will continue to learn about different bodily functions in Years 5 and 6.

National Curriculum Knowledge:

- 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

Year 5 Autumn 2: Forces

Strand: Physics

Main ideas:

Pupils build upon their forces knowledge from Year 3 and they look at gravity again, recapping the fact that objects are pulled towards the earth by gravity. Children look further into air resistance, friction and water resistance and apply their knowledge of these forces to explain movement between surfaces.

Pupils also apply their knowledge to discover how levers, pulleys and gears work as a way of enabling a small force to have a large effect.

Previous knowledge:

Forces are looked at in both Year 3 and Year 5. In both of these years, gravity, air resistance, water resistance and friction are looked at and children consider how an object's movement is affected by different types of surfaces. In Year 5, the learning is developed further when children look at levers and pulleys in relation to forces.

National Curriculum Knowledge:

- 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 a smaller force to have a greater effect

Year 5 Spring 1: Earth and space

Strand: Physics

Main ideas:

Pupils learn about the solar system – considering the movement of the Earth around the sun, and the movement of the other planets in the solar system. Pupils learn about the moon also and about its rotation around the Earth. Using their knowledge about the Earth's rotation, pupils are taught to explain why we have day and night.

Previous knowledge:

This Year 5 unit is the only one taught on Earth and Space in primary school. Pupils will have looked at some related facts to do with the Earth in Year 1 (such as seasons) and in Year 3 (such as light and shadows), however this is the only time that they will explicitly learn about space.

National Curriculum Knowledge:

- 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

Year 5 Summer 1: Materials (Properties and changes of materials)

Strand: Chemistry

Main ideas:

In this unit, pupils look (in more depth) at different materials and their properties. They consider which materials may dissolve in a liquid to form a solution, and whether they would be able to get the substance back. Pupils learn about solids, liquids and gases and use this knowledge to decide how they would separate a mixture.

Previous knowledge:

Pupils have completed a variety of units on 'materials' before in years 1, 2, 3 and 4.

National Curriculum Knowledge:

- 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
- 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

Year 5 Summer 2: Living things and their habitats (Life cycles)

Strand: Biology

Main ideas:

In this unit, pupils look at lifecycles. They compare the lifecycles of mammals, birds, insects and amphibians and consider the ways in which they are similar and different. Pupils also look at how some plants and animals reproduce.

National Curriculum Knowledge:

- 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

<p>Previous knowledge: In Year 2, pupils started to look at the fact that animals have offspring, which has some links to this unit. This is expanded upon in Year 4 when pupils learn that reproduction is one of the characteristics of a living organism. Pupils learn about the lifecycle of a plant in Year 3, which can be applied to their Year 5 learning.</p>	
<p>Year 5 Summer 2: Animals including humans (Growing and changing) Strand: Biology</p>	
<p>Main ideas: Pupils continue to look at the life cycle of humans and consider the stages of development from being a baby to being an elderly person. Students consider the changes that a human being experiences when going from adulthood to old age.</p> <p>Previous knowledge: Students learn about the human body in Year 3 when they look at the skeletal and muscular system in the body. Pupils also looked at the digestive system in Year 4. In Year 6, pupils will look in even more depth at the human body when they consider how the circulatory system works.</p>	<p>National Curriculum Knowledge:</p> <ul style="list-style-type: none"> describe the changes as humans develop to old age

Year 6 Autumn 1: Light

Strand: Physics

Main ideas:

During this unit, pupils learn to differentiate between natural and man-made light sources. They learn that we see when light travels from a light source to an object, and then reflects off the object and into our eyes. They learn that the INA BRIDGES wheel, created by Isaac Newton, is in fact a colour wheel made up of the 7 colours of the visible light spectrum. They learn that this colour wheel, when spun, demonstrates that the 7 colours of the visible light spectrum make up white light. Children learn that light travels in straight lines and discuss ways in which we can prove this, such as with shadows.

Previous knowledge:

Pupils learned all about light in Year 3 and started to develop an understanding of how we see. In Year 3, pupils learned about how light travels, why certain things are certain colours, and how shadows are formed.

National Curriculum Knowledge:

- 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

Year 6 Autumn 1: Electricity

Strand: Physics

Main ideas:

Pupils recap their knowledge on how to put together a simple circuit with a switch. They learn to draw these circuits scientifically, using the recognised symbols. Pupils learn to associate the brightness of a bulb or the volume of a buzzer with how much power is in the circuit, determining that the greater amount of power means the greater amount of energy, and thus a brighter bulb/louder buzzer.

Previous knowledge:

Pupils studied electricity in Year 4 where they learned to create a simple circuit. They also learned to draw a simple circuit using scientific symbols.

National Curriculum Knowledge:

- 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

<p>They then used their knowledge on circuits to produce a functioning burglar alarm. Pupils also considered what uses electricity and what runs on batteries.</p>	
<p>Year 6 Spring 1: Animals including humans (Circulatory system) Strand: Biology</p>	
<p>Main ideas: Pupils learn to identify the parts of the circulatory system. They look at what the heart looks like and how it functions and learn to explain how the heart pumps blood around the body. Pupils learn about the blood vessels (veins, arteries, and capillaries) and look at how these aid in the transport of blood and nutrients around the body. Pupils consider different lifestyle choices which can affect the body, such as exercise, drugs and diet. Pupils recap how a healthy diet and exercise can have a positive affect on the way that the body functions, and how drugs (both legal and illegal) affect our bodies.</p> <p>Previous knowledge: This unit is the final one of the 'Animals Including Humans' units which have run throughout KS1 and KS2.</p>	<p>National Curriculum Knowledge:</p> <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
<p>Year 6 Summer 2: Evolution and inheritance Strand: Biology</p>	
<p>Main ideas: Pupils consider how living organisms change and develop over time, and how scientists use fossils to prove this. Pupils learn that living things produce offspring of the same kind, but that the offspring vary and aren't identical. They also learn about the evolution of humans and how humans evolved from apes by adapting (over millions of years) to suit their environment, When learning about evolution, they consider Charles' Darwin's theory of evolution and look also at other theories which have been considered in the past.</p>	<p>National Curriculum Knowledge:</p> <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

<p>Previous knowledge: Pupils recap on some knowledge learned in Year 3 about fossils and consider how fossils help us to learn about evolution.</p>	<ul style="list-style-type: none"> • identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution
<p>Year 6 Summer 2: Living things and their habitats (Classification) Strand: Biology</p>	
<p>Main ideas: Pupils look at how living organisms can be classified based on their similar characteristics. Pupils consider how to classify animals, plants and micro-organisms.</p> <p>Previous knowledge: This unit builds upon the classification unit from Year 4 whereby students looked at living organisms, their environment, and how they can be grouped together.</p>	<p>National Curriculum Knowledge:</p> <ul style="list-style-type: none"> • describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals • give reasons for classifying plants and animals based on specific characteristics