# Ash Grove Primary Academy Science
# Progression Grid

**Children have the opportunity to work scientifically throughout each each unit of work to develop their understanding and knowledge. Each academic year, students will study topics within the three broad areas of Biology, Physics and Chemistry. An exemplar series of lessons is available to support staff in developing these units of work and, over time, pupils' knowledge and skills in science.**

| | | | |
|---|---|---|---|
| | **At Key Stage One:**<br>During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:<br>• asking simple questions and recognising that they can be answered in different ways<br>• observing closely, using simple equipment<br>• performing simple tests<br>• identifying and classifying<br>• using their observations and ideas to suggest answers to questions<br>• gathering and recording data to help in answering questions | **At Lower Key Stage Two:**<br>During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:<br>• asking relevant questions and using different types of scientific enquiries to answer them<br>• setting up simple practical enquiries, comparative and fair tests<br>• making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers<br>• gathering, recording, classifying and presenting data in a variety of ways to help in answering questions<br>• recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables<br>• reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions<br>• using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions<br>• identifying differences, similarities or changes related to simple scientific ideas and processes<br>• using straightforward scientific evidence to answer questions or to support their findings | **At Upper Key Stage Two:**<br>During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:<br>• planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary<br>• taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate<br>• recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs<br>• using test results to make predictions to set up further comparative and fair tests<br>• reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations<br>• identifying scientific evidence that has been used to support or refute ideas or arguments |
| | **Science Tier 3 Vocabulary @ KS1:** | **Science Tier 3 Vocabulary @ LKS2:** | **Science Tier 3 Vocabulary @ UKS2:** |
| | observe, observing, identify, classify, diagram, chart, map, data, contrast, biology, chemistry, physics, | research, scientific enquiry, comparative and fair test, conclusion, predictions, differences, similarities, evidence, guides, keys, construct, interpret | variables, precision, repeat readings, classification keys, causal relationship, explanations, degree of trust, quantitative measurements |

**The Key Stage One curriculum builds on the foundation work completed throughout Early Years. The following progression highlights 'expected' level for areas of the Science curriculum which is woven throughout the different aspects of Early Years curriculum**

| **Understanding of the World**<br>**Personal Development**<br>**Physical Development** | | |
|---|---|---|
| Biology | Chemistry | Physics |
| **At Nursery:**<br>- Observational and investigative skills… I wonder if…<br>- Look at life cycles<br>- Taking care of animals and first hard explorations including chicks and caterpillars<br>- Explore light and dark including shadows<br>- Using our senses<br>- Protecting ourselves<br>- Plants and Living Things – how do they grow?<br><br>**Examples of specific disciplinary science:**<br>- Make collections of natural objects and talk about different types of leaves, seeds, rocks etc<br>- Plant seeds and care for growing plants<br>- Show and explain concepts of growth, change and decay e.g. observe an apple going brown and mouldy over time<br>- Understand the key features of lifecycle of a plant/animal<br>- Explore and talk about forces we n feel e.g. magnetic attraction and repulsion, how water pushes up when you push a boat under it<br>- Explore how materials float and sink<br>- Talk about differences in materials and how they change e.g. melting and cooling<br>- Explore how light can shine through some materials and not others.<br>- Investigate shadows<br>- Kite marking – which materials are lifted easily by the wind?<br>- Exploring the seasons using our senses and observations | | |

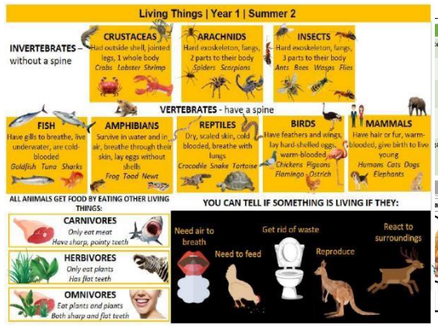
| **Understanding of the World**<br>**Personal Development**<br>**Physical Development** | | |
|---|---|---|
| Biology | Chemistry | Physics |
| **At Reception:**<br>- Explore the natural world around them, making observations and drawing pictures of animals and plants<br>- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experience and what has been read in class<br>- Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter<br>- Offer explanations for why things might happen, making use of recently introduced vocabulary from stories, non-fiction, rhymes and poems when appropriate | **At Reception:**<br>- Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter<br>- Explain some similarities and differences between states of matter | **At Reception:**<br>- Know that our world is called Earth<br>- Know that Earth is a planet and that we have other plants including their names<br>- Understand that the Sun is a star not a planet<br>- Explore floating and sinking and different objects<br>- Know about different textures and materials and how they feel using adjectives to describe this |
| **Examples of specific disciplinary science:**<br>- Opportunities to use senses to observe<br>- Sing songs and rhymes about the natural world<br>- Draw pictures of the natural world after close observation, including animals and plants<br>- Observe and interact with natural processes e.g. ice melting, sound causing vibration, light travelling through transparent material, object casting a shadow, magnet attracting an object and a boat floating on water.<br>- Focused observations of the natural world<br>- Describe and comment on things they have seen, including plants and animals.<br>- Name and describe some plants and animals that children are likely to see<br>- Teach children about a range of contrasting environments<br>- Vocabulary to name specific features both natural and man made.<br>- Understand the effect of changing seasons.<br>- Draw attention to weather and seasonal features<br>- Provide opportunities for children to note and record the weather.<br>- Share texts about the changing seasons<br>- Observe how animals behave differently as the seasons change. | | |

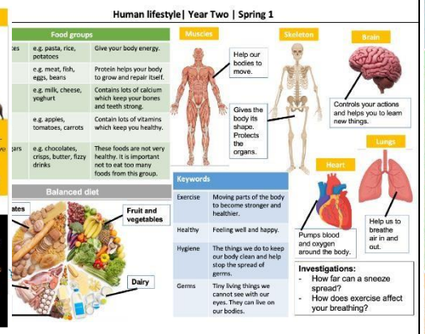
| **Repeated Vocabulary** |
|---|
| Scientist, experiment, Earth, natural/man-made, season, animal, plant, environment, healthy, texture, life cycle, larva, pupa, metamorphosis, habitats |

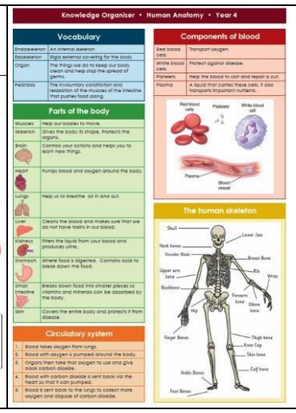
| | | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
|---|---|---|---|---|---|---|---|
| KS1 | Year A | Sound | Seasons & weather | Light | Animal Kingdom | Habitats | Human Lifestyle |
| | Awe & Wonder | Investigate pitch and volume of sounds. | Create a weather log. | How to test if an object is reflective.<br>Investigating shadows. | Do similar animals live in similar places? | Investigate the features of a habitat. | Impact of different exercises on our body.<br>Why should we wash our hand before we eat? |
| | Year B | Materials | Building things | Changing materials | Mixing and making | Plants | Space<br>- |
| | Awe & Wonder | Does it bend or stretch? | Investigating materials that are fit for purpose. | Can all solid objects change shape in the same way?<br>Which materials are elastic / absorbent / waterproof? | Can you melt an ice cube in your hands?<br>Which mixture makes the best bubbles? Which materials are soluble in water? | Investigate what a plant needs to grow. | Human solar system |
| LKS2 | Year A | Phases of Matter | Rock Cycle | Light | Space | Adaptations | Human Anatomy |
| | Awe & Wonder | Investigating different objects in different phases of matter. | Investigate the formation of sedimentary rocks, weathering and erosion. | Refraction with a pencil in oil, torches and mirror, periscopes, white light etc | Investigate the changes in the moon using a Moon diary. | | Effect of different liquids on teeth.<br>Recreate a digestive system and observe the changes in the food as it travels through the system. |
| | Year B | Practical Skills | Raw & Synthetic materials | Sound | Forces | Plants | Ecosystems |
| | Awe & Wonder | Learning about the elements of a scientific investigation | Make recycled paper | Investigation into what blocks sound.<br>Build a musical instrument. Make a string telephone. | Investigate the force of friction.<br>Investigate magnetic fields and buoyancy. | Dissecting flowers | Investigate the role of leaves in photosynthesis. |
| UKS2 | Year A | Chemical Reactions | Sustainability | Heat | Energy | Cells | Diet and Lifestyle |
| | Awe & Wonder | Dissolving, filtering and sieving.<br>Investigating if its chemical reaction or physical change. | | How to stop an ice cube from melting?<br>Investigating how heat transfer works. | Using the formula to calculate energy and speed and investigating their own speed. | Can we grow potatoes from a cutting? | Design an investigation into how effective different antiseptics are? |
| | Year B | Separating Mixtures | Physical and Chemical Changes | Magnetism | Electrical Circuits | Humans and Animals over Time | Reproductive Cycles |
| | Awe & Wonder | Investigate evaporation.<br>Investigation into your own types of formulations.<br>Investigation to separate out your own mixture of gravel, sand and water. | Investigate which metal is the most reactive when it is placed in vinegar. | Use bar magnets to investigate how the magnetic force acts.<br>Use bar magnets and paper clips to test the strength of the magnet.<br>Investigation to find out how to sort magnetic and non-magnetic materials.<br>Investigation to build an electromagnet. | Investigation below to test whether the materials you have been given are electrical conductors or electrical insulators.<br>Investigation to see what effect changing the number of cells OR the number of bulbs has on the circuit. | Investigating how finches have adapted their beaks (Darwin's finches). | Can you grow your own potatoes from a cutting? |

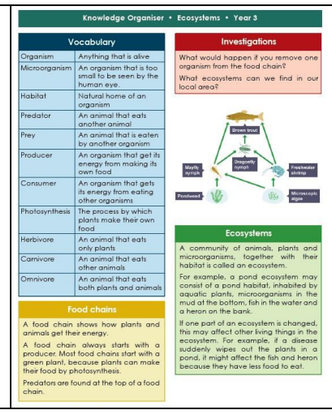
| Biology - Animals including humans | | | | |
|---|---|---|---|---|
| | **Key Stage One** | **Lower Key Stage Two** | | **Upper Key Stage Two** |
| **Substantive Knowledge** | • identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals<br>• identify and name a variety of common animals that are carnivores, herbivores and omnivores<br>• describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets)<br>• identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense<br>• notice that animals, including humans, have offspring which grow into adults<br>• find out about and describe the basic needs of animals, including humans, for survival (water, food and air)<br>• describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene | • 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<br>• identify that humans and some other animals have skeletons and muscles for support, protection and movement<br>• identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood<br>• recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function<br>• describe the ways in which nutrients and water are transported within animals, including humans | • describe the simple functions of the basic parts of the digestive system in humans<br>• identify the different types of teeth in humans and their simple functions<br>• construct and interpret a variety of food chains, identifying producers, predators and prey | • describe the changes as humans develop to old age |
| **Disciplinary Knowledge** | Can they point out some of the differences between different animals?<br>• Can they sort photographs of living things and non-living things?<br>• Can they identify and name a variety of common animals? (birds, fish, amphibians, reptiles, mammals, invertebrates)<br>• Can they describe how an animal is suited to its environment?<br>• Can they identify and name a variety of common animals that are carnivores, herbivores and omnivores<br>• Can they name the parts of the human body that they can see?<br>• Can they draw & label basic parts of the human body?<br>• Can they identify the main parts of the human body and link them to their senses?<br>• Can they name the parts of an animal's body?<br>• Can they name a range of domestic animals?<br>• Can they classify animals by what they eat? (carnivore, herbivore, omnivore)<br>• Can they compare the bodies of different animals?<br>• Can they describe what animals need to survive?<br>• Can they explain that animals grow and reproduce?<br>• Can they explain why animals have offspring which grow into adults?<br>• Can they describe the life cycle of some living things? (e.g. egg, chick, chicken)<br>• Can they explain the basic needs of animals, including humans for survival? (water, food, air)<br>• Can they describe why exercise, balanced diet and hygiene are important for humans?<br>• Can they begin to classify animals according to a number of given criteria?<br>• Can they point out differences between living things and non-living things?<br>• Can they name some parts of the human body that cannot be seen?<br>• Can they say why certain animals have certain characteristics?<br>• Can they name a range of wild animals?<br>• Can they explain that animals reproduce in different ways? | • Can they explain the importance of a nutritionally balanced diet?<br>• Can they describe how nutrients, water and oxygen are transported within animals and humans?<br>• Can they identify that animals, including humans, cannot make their own food: they get nutrition from what they eat?<br>• Can they describe and explain the skeletal system of a human?<br>• Can they describe and explain the muscular system of a human? Extend<br>• Can they explain how the muscular and skeletal systems work together to create movement?<br>• Can they classify living things and non-living things by a number of characteristics that they have thought of?<br>• Can they explain how people, weather and the environment can affect living things?<br>• Can they explain how certain living things depend on one another to survive?<br>• Can they identify and explain the function of the organs of the human circulatory system? (heart, blood vessels, blood, blood pressure, clotting)<br>• Can they identify and explain the function of the organs of the human gaseous exchange system? (lungs, nose, throat, bronchi, bronchial tubes, diaphragm, ribs, breathing)<br>• Can they name the major organs in the human body?<br>• Can they locate the major human organs?<br>• Can they make a diagram that outlines the main parts of a body?<br>• Can they explore the work of medical pioneers, for example, William Harvey and Galen and recognise how much we have learned about our bodies?<br>• Can they compare the organ systems of humans to other animals? Can they make a diagram of the human body and explain how different parts work and depend on one another | • Can they identify and name the basic parts of the digestive system in humans?<br>• Can they describe the simple functions of the basic parts of the digestive system in humans?<br>• Can they identify the simple function of different types of teeth in humans?<br>• Can they compare the teeth of herbivores and carnivores?<br>• Can they explain what a simple food chain shows?<br>• Can they construct and interpret a variety of food chains, identifying producers, predators and prey?<br>• Can they classify living things and non-living things by a number of characteristics that they have thought of?<br>• Can they explain how people, weather and the environment can affect living things?<br>• Can they explain how certain living things depend on one another to survive? | Can they describe the changes as humans develop to old age?<br>• Can they create a timeline to indicate stages of growth in certain animals, such as frogs and butterflies?<br>• Can they describe the changes experienced in puberty?<br>• Can they draw a timeline to indicate stages in the growth and development of humans? |
| **Vocabulary** | amphibian, bird, fish, gills, mammal, reptile, carnivores, herbivores, omnivores senses, smell, taste, hear, see, touch<br>offspring, survival, nutrition, reproduce, hygiene, lifecycle | endoskeleton, exoskeleton, carbohydrates, protein, fats, fibre, vitamins, minerals, vertebrate, invertebrate, socket/hinge/gliding joint, muscles<br>digestive system, oesophagus, acid, enzymes, intestine, colon, incisors, canines, molars | producer, consumer, predator, prey, classification, ecosystem, | puberty, life cycle, gestation, foetus, fertilisation, adolescence<br>organ system, tissues, cells, liver, kidney, lungs, circulatory system, blood vessels, nutrients, |

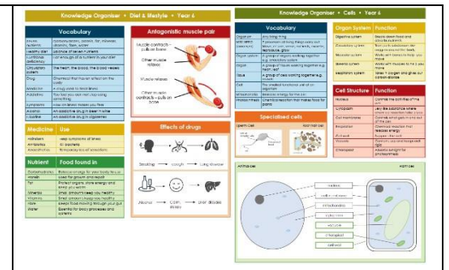
**Expectation of skills progression**



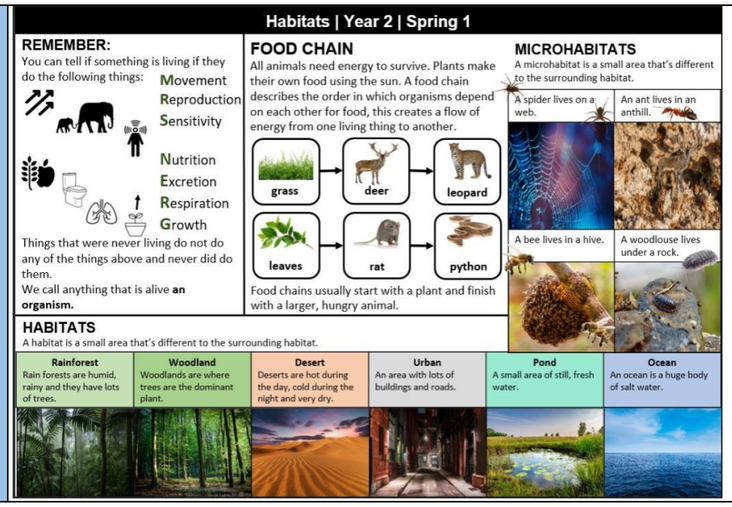



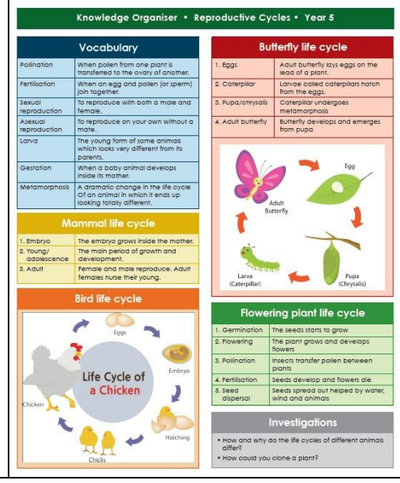




| | Biology - Living things and their habitats | | | |
|---|---|---|---|---|
| | **Key Stage One** | **Lower Key Stage Two** | | **Upper Key Stage Two** |
| **Substantive Knowledge** | • explore and compare the differences between things that are living, dead, and things that have never been alive<br>• identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other<br>• identify and name a variety of plants and animals in their habitats, including microhabitats<br>• 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 | • recognise that living things can be grouped in a variety of ways<br>• explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment<br>• recognise that environments can change and that this can sometimes pose dangers to living things | • 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<br>• give reasons for classifying plants and animals based on specific characteristics | • describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird<br>• describe the life process of reproduction in some plants and animals |
| **Disciplinary Knowledge** | • Can they match certain living things to the habitats they are found in?<br>• Can they explain the differences between living and non-living things?<br>• Can they describe some of the life processes common to plants and animals, including humans?<br>• Can they decide whether something is living, dead or non-living?<br>• Can they describe how a habitat provides for the basic needs of things living there?<br>• Can they describe a range of different habitats?<br>• Can they describe how plants and animals are suited to their habitat?<br>• Can they name some characteristics of an animal that help it to live in a particular habitat?<br>• Can they describe what animals need to survive and link this to their habitats? | • Can they recognise that living things can be grouped in a variety of ways?<br>• Can they explore and use a classification key to group, identify and name a variety of living things? (plants, vertebrates, invertebrates)<br>• Can they compare the classification of common plants and animals to living things found in other places? (under the sea, prehistoric)<br>• Do they recognise that environments can change and this can sometimes pose a danger to living things?<br>• Can they give reasons for how they have classified animals and plants, using their characteristics and how they are suited to their environment?<br>• Can they explore the work of pioneers in classification? (e.g. Carl Linnaeus)<br>Can they name and group a variety of living things based on feeding patterns? | • Can they explain the classification of living things into broad groups based on common observable characteristics? (five kingdoms of all living things, vertebrates, mammals, marsupials)<br>• Can they sub divide their original groupings and explain their divisions?<br>• Can they group animals into vertebrates and invertebrates?<br>• Can they explain why classification is important?<br>• Can they readily group animals into reptiles, fish, amphibians, birds and mammals?<br>• | • Can they describe the differences in the life cycles of a mammal, an amphibians, an insects and a bird?<br>• Can they describe the life cycles of common plants?<br>• Can they explore the work of well know naturalists and animal behaviourists? (David Attenborough and Jane Goodall)<br>• Can they observe their local environment and draw conclusions about life-cycles, e.g. plants in the vegetable garden or flower border?<br>• Can they compare the life cycles of plants and animals in their local environment with the life cycles of those around the world, e.g. rainforests? |
| **Vocabulary** | living, dependant, habitat, microhabitat, food chain, conditions | ecosystems, adaptation, nocturnal, organism, marine, diurnal, echolocation, vertebrate, | domain, kingdom, phylum, class, order, family, genus, species, characteristics | sexual, asexual reproduction, metamorphosis, |

Expectation of skills progression

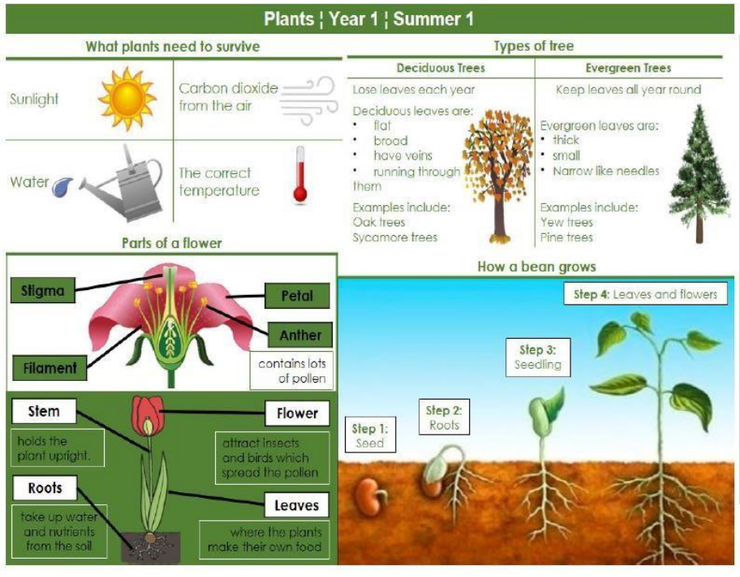







| Biology - Plants | | | | |
|---|---|---|---|---|
| | **Key Stage One** | **Lower Key Stage Two** | **Upper Key Stage Two** | |
| **Substantive Knowledge** | • identify and name a variety of common wild and garden plants, including deciduous and evergreen trees<br>• identify and describe the basic structure of a variety of common flowering plants, including trees<br>• observe and describe how seeds and bulbs grow into mature plants<br>• find out and describe how plants need water, light and a suitable temperature to grow and stay healthy | • identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers<br>• 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<br>• 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 | | |
| **Disciplinary Knowledge** | • Can they name the petals, stem, leaf, bulb, flower, seed, stem and root of a plant?<br>• Can they identify and name a range of common plants and trees?<br>• Can they recognise deciduous and evergreen trees?<br>• Can they name the trunk, branches and root of a tree?<br>• Can they describe the parts of a plant (roots, stem, leaves, flowers)?<br>• Can they describe what plants need to survive?<br>• Can they observe and describe how seeds and bulbs grow into mature plants?<br>• Can they find out & describe how plants need water, light and a suitable temperature to grow and stay healthy?<br>• Can they name the main parts of a flowering plant?<br>• Can they describe what plants need to survive and link it to where they are found?<br>• Can they explain that plants grow and reproduce in different ways? | • Can they identify and describe the functions of different parts of flowering plants? (roots, stem/trunk, leaves and flowers)?<br>• Can they explore the requirement of plants for life and growth (air, light, water, nutrients from soil, and room to grow)?<br>• Can they explain how they vary from plant to plant?<br>• Can they investigate the way in which water is transported within plants?<br>• Can they explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal? | | |
| Vocabulary | wild plants, garden plants, deciduous, evergreen, plant, leaf, root, leaves, bud, flowers, blossom, petals, stem, tree, trunk, branches, fruit, vegetables, bulb, seed germination, reproduction, mature, survive, | flowering plant, germination, seed dispersal, adaptations, transpiration, functions, pollination | | |

Expectation of skills progression



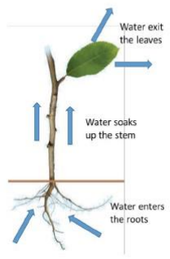

Knowledge Organiser • Plants • Year 3

| Factor | Effect on plant growth |
|---|---|
| Light brightness | Increasing the brightness of light during the day increases growth |
| Water level | Plants need a steady supply of water to increase growth (but not too much!) |
| Warmth | Plants will grow more quickly in warm conditions (but not too hot!) |
| Nutrients | Plants will grow more quickly when they have nutrients available (which can be found in soil) |

| Process | Description |
|---|---|
| Germination | the process of a plant beginning to grow from a seed |
| Flowering | when the stem and leaves have grown and a flower begins to bud |
| Pollination | the process of pollen being moved from anther to stigma |
| Fertilisation | when pollen travels down to join with an ovule in the ovary |
| Seed dispersal | how seeds are spread away from a plant to be able to grow in a new location |

| Flower parts | Function |
|---|---|
| Sepals | the green part that protects flowers before they open |
| Ovule | the egg part of the plant that contains female sex cells |
| Ovary | the part of the plant where the ovules are produced |
| Style | the long stalk that connects the stigma to the ovary |
| Stigma | the sticky top of the style that collects pollen |
| Petal | Outer part of a flower that attracts insects (usually with bright colours) |
| Filament | Thinner long stalk that holds up the anther |
| Anther | the part that produces pollen (the male sex cell) |

Transpiration is the process of water exiting a plant's leaves through small gaps called stomata.




| Biology - Evolution and inheritance | | | | | |
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| | Key Stage One | | Lower Key Stage Two | | Upper Key Stage Two |
| Substantive Knowledge | | | | | • recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago<br>• recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents<br>• identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution |
| Disciplinary Knowledge | | | | | • Can they give reasons for why living things produce offspring of the same kind?<br>• Can they give reasons for why offspring are not identical with each other or with their parents?<br>• Can they explain the process of evolution and describe the evidence for this?<br>• Can they begin to appreciate that variation in offspring over time can make animals more or less able to survive in particular environments?<br>• Can they talk about the life of Charles Darwin?<br>• Can they explain how some living things adapt to survive in extreme conditions?<br>• Can they analyse the advantages and disadvantages of specific adaptations, such as being on two rather than four feet?<br>• Can they begin to understand what is meant by DNA? |
| Vocabulary | | | | | evolution, fossilisation, homo sapiens, species, conservationist, adaptation, variation, inheritance, adaptation, traits |

| | | | | | |
|---|---|---|---|---|---|
| **Expectation of skills progression** | | | | | |

**Knowledge Organiser • Humans & Animals Over Time • Year 5**

### Fossilisation process

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| Animal dies, its skeleton settles on the sea floor and is buried by sediment. |
| The sediment surrounding the skeleton thickens and begins to turn to stone. |
| The skeleton dissolves and a mould is formed. |
| Minerals crystallise inside the mould and a cast is formed. |
| The fossil is exposed in the Earth's surface. |

### How evolution works:

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|---|
| 1. Not all individuals of a species are exactly the same. There is variation between them. |
| 2. The individuals of a species who are best adapted to their environment are most likely to survive. |
| 3. These individuals are more likely reproduce and pass their useful adaptations onto their offspring. |
| 4. Individuals that were poorly adapted were less likely to survive. |
| 5. Over time, the characteristics that help survival become more common and a species gradually changes. |
| 6. Given enough time, these small changes can add up to the extent that a new species altogether can evolve. |

**Variation**
The differences between living things in a species.

**Adaptation**
How living things are specialised to suit their environment.

**Species:**
A group of living things with very similar characteristics. They can breed together to make more living things of the same type.

**Evolution:**
The process by which living things can gradually change over time.

### Charles Darwin

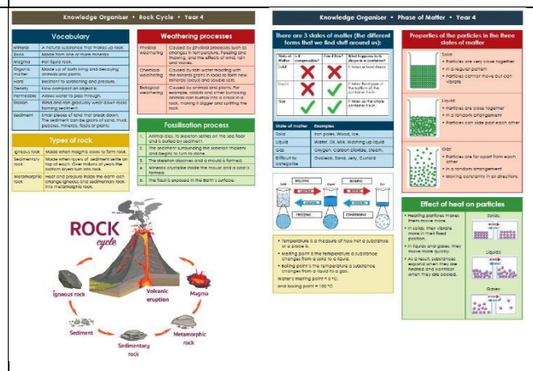
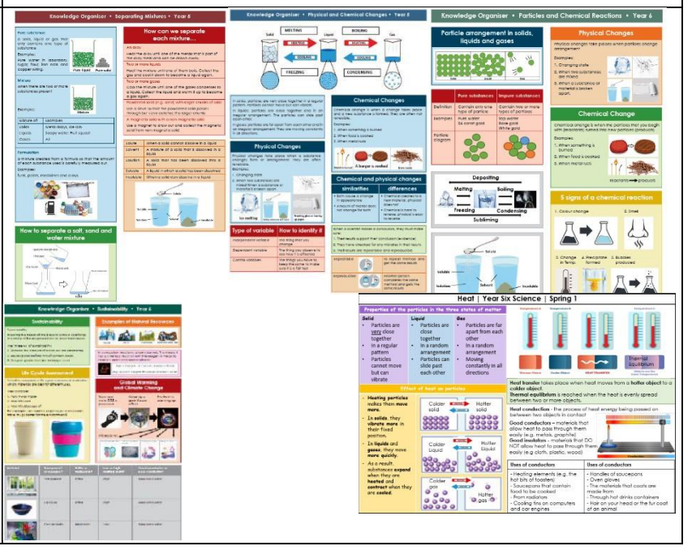
Born: 1809
Died: 1882
Nationality: British
Famous for: his book 'On the Origin of Species' (1859). In his book he laid out his theory of evolution which was very controversial at the time but is now widely accepted as scientific fact.

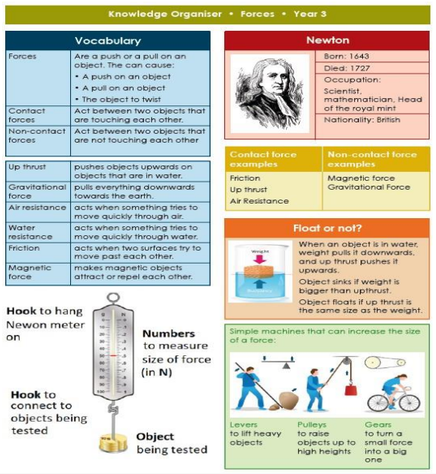
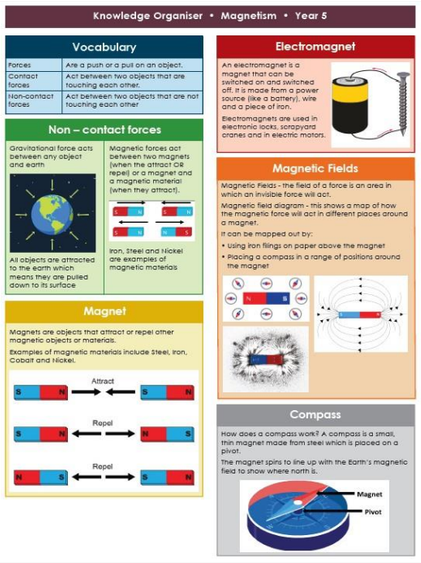
### Life on Earth timeline

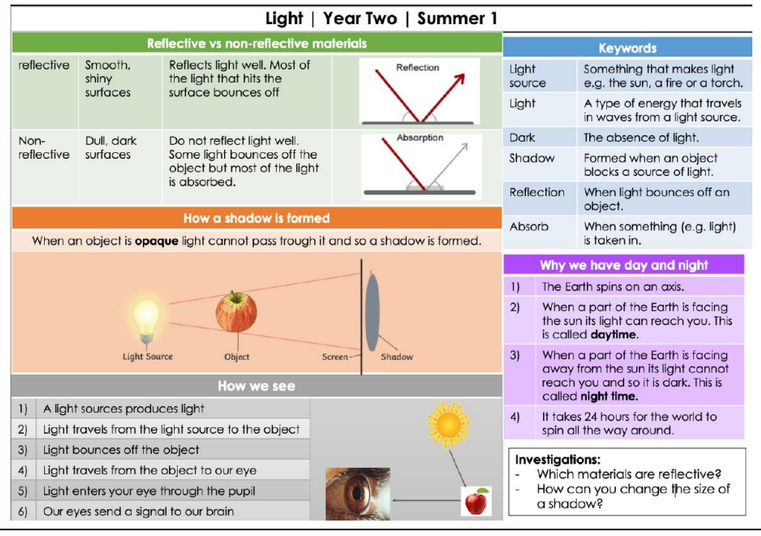
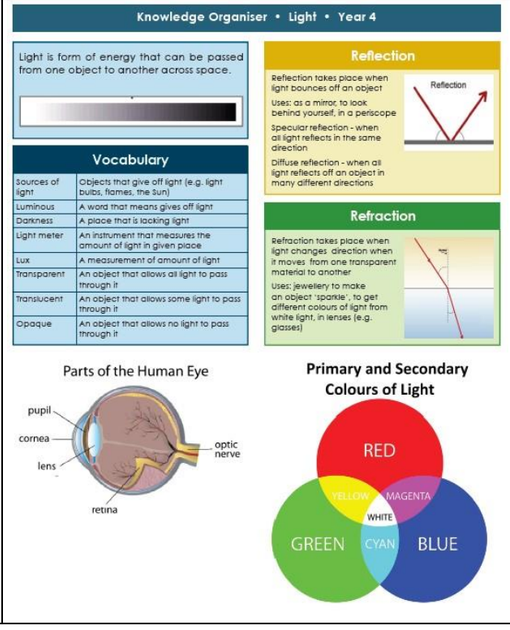
| | | |
|---|---|---|
| Cenozoic Era | Modern humans first appear (Homo sapiens) | 0.2 mya |
| | First human-like animals appear | 2.5 mya |
| Mesozoic Era | Dinosaurs go extinct | 66.4 mya |
| | First flowering plants | 141 mya |
| | First birds | 195 mya |
| | First dinosaurs and mammals | 230 mya |
| Paleozoic Era | First reptiles | 340 mya |
| | First insects | 360 mya |
| | First amphibians | 370 mya |
| | Plants appear on land | 420 mya |
| | Cambrian explosion – the first fish | 530 mya |
| Proterzoic Era | Simple single celled creatures appear | 700 mya |
| | Algae, fungi, single-celled animals appear | 2100 mya |
| | Life first begins with single-celled creatures like bacteria | 3600 mya |

## Chemistry - Materials

| | Key Stage One | Lower Key Stage Two | Upper Key Stage Two |
|---|---|---|---|
| **Substantive Knowledge** | • distinguish between an object and the material from which it is made<br>• identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock<br>• describe the simple physical properties of a variety of everyday materials<br>• compare and group together a variety of everyday materials on the basis of their simple physical properties<br>• identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses<br>• find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching | • compare and group together different kinds of rocks on the basis of their appearance and simple physical properties<br>• describe in simple terms how fossils are formed when things that have lived are trapped within rock<br>• recognise that soils are made from rocks and organic matter<br>• compare and group materials together, according to whether they are solids, liquids or gases<br>• 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)<br>• identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature | • 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<br>• know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution<br>• use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating<br>• give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic<br>• 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<br>  • the action of acid on bicarbonate of soda |

| | | | |
|---|---|---|---|
| **Disciplinary Knowledge** | • Can they distinguish between an object and the material from which it is made?<br>• Can they describe materials using their senses?<br>• Can they describe materials using their senses, using specific scientific words?<br>• Can they explain what material objects are made from?<br>• Can they explain why a material might be useful for a specific job?<br>• Can they name some different everyday materials? e.g. wood, plastic, metal, water and rock<br>• Can they sort materials into groups by a given criteria?<br>• Can they explain how solid shapes can be changed by squashing, bending, twisting and stretching?<br>• Can they describe the simple physical properties of a variety of everyday materials?<br>• Can they compare and group together a variety of materials based on their simple physical properties?<br>• Can they explore how the shapes of solid objects can be changed? (squashing, bending, twisting, stretching)<br>• Can they find out about people who developed useful new materials? (John Dunlop, Charles Macintosh, John McAdam)<br>• Can they identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper, cardboard for particular uses?<br>• Can they explain how things move on different surfaces?<br>• Can they describe things that are similar and different between materials?<br>• Can they explain what happens to certain materials when they are heated, e.g. bread, ice, chocolate?<br>  • Can they explain what happens to certain materials when they are cooled, e.g. jelly, heated chocolate?<br>• Can they describe the properties of different materials using words like, transparent or opaque, flexible, etc.?<br>• Can they sort materials into groups and say why they have sorted them in that way?<br>• Can they say which materials are natural and which are man made?<br>• Can they explain how materials are changed by heating and cooling?<br>• Can they explain how materials are changed by bending, twisting and stretching?<br>• Can they tell which materials cannot be changed back after being heated, cooled, bent, stretched or twisted? | • Can they compare and group together different rocks on the basis of their appearance and simple physical properties?<br>• Can they describe and explain how different rocks can be useful to us?<br>• Can they describe and explain the differences between sedimentary and igneous rocks, considering the way they are formed?<br>• Can they describe in simple terms how fossils are formed when things that have lived are trapped within rock?<br>  • Can they recognise that soils are made from rocks and organic matter?<br>• Can they classify igneous and sedimentary rocks?<br>• Can they begin to relate the properties of rocks with their uses?<br>• Can they compare and group materials together, according to whether they are solids, liquids or gases?<br>• Can they explain what happens to materials when they are heated or cooled?<br>• Can they measure or research the temperature at which different materials change state in degrees Celsius?<br>• Can they use measurements to explain changes to the state of water?<br>• Can they identify the part that evaporation and condensation has in the water cycle?<br>• Can they associate the rate of evaporation with temperature?<br>• Can they group and classify a variety of materials according to the impact of temperature on them?<br>• Can they explain what happens over time to materials such as puddles on the playground or washing hanging on a line?<br>• Can they relate temperature to change of state of materials? | • Can they compare and group together everyday materials on the basis of their properties, including hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets?<br>• Can they explain how some materials dissolve in liquid to form a solution?<br>• Can they describe how to recover a substance from a solution?<br>• Can they use their knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving, evaporating?<br>• Can they give reasons, based on evidence for comparative and fair tests for the particular uses of everyday materials, including metals wood and plastic?<br>• Can they describe changes using scientific words? (evaporation, condensation)<br>• Can they demonstrate that dissolving, mixing and changes of state are reversible changes?<br>• Can they explain that some changes result in the formation of new materials, and that this kid of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda?<br>• Can they use the terms 'reversible' and 'irreversible'?<br>• Can they describe methods for separating mixtures? (filtration, distillation)<br>• Can they work out which materials are most effective for keeping us warm or for keeping something cold?<br>• Can they use their knowledge of materials to suggest ways to classify? (solids, liquids, gases)<br>• Cant hey explore changes that are difficult to reverse, e.g. burning, rusting and reactions such as vinegar with bicarbonate of soda?<br>  • Can they explore the work of chemists who created new materials, e.g. Spencer Silver (glue on sticky notes) or Ruth Benerito (wrinkle free cotton)? |
| **Vocabulary** | absorbent , waterproof, material, properties, wood, plastic, metal, water, rock, magnetic, attract, repel, translucent, opaque<br>fabric, brittle, flexible, mixture, length, height, weight, design | igneous, sedimentary, metamorphic, rock cycle, chemical weathering, metamorphosis, intrusive, extrusive<br>solids, liquids, gases, state of matter, particles, non-newtonian fluid, properties, evaporation, condensation | pure substances, mixtures, formulation, insoluble, soluble, condensation, solubility, transparency, conductivity, physical changes, chemical changes, combustion, irreversible, insulation, |
| **Expectation of skills progression** |  |  |  |

| Physics - Forces | | | |
|---|---|---|---|
| | **Key Stage One** | **Lower Key Stage Two** | **Upper Key Stage Two** |
| **Substantive Knowledge** | | • explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object<br>• identify the effects of air resistance, water resistance and friction, that act between moving surfaces<br>• recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect | • compare how things move on different surfaces<br>• notice that some forces need contact between 2 objects, but magnetic forces can act at a distance<br>• observe how magnets attract or repel each other and attract some materials and not others<br>• 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 |
| **Disciplinary Knowledge** | | • Can they explain that unsupported objects fall towards the earth because of the force of gravity acting between the earth and the falling object?<br>• Can they identify the effects of air resistance, water resistance and friction that act between moving surfaces?<br>• Can they recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect?<br>• Can they describe and explain how motion is affected by forces? (including gravitational attractions, magnetic attraction and friction)<br>• Can they design very effective parachutes?<br>• Can they work out how water can cause resistance to floating objects?<br>• Can they explore how scientists, such as Galileo Galilei and Isaac Newton helped to develop the theory of gravitation? | • Can they compare how things move on different surfaces?<br>• Can they observe that magnetic forces can be transmitted without direct contact?<br>• Can they observe how some magnets attract or repel each other?<br>• Can they classify which materials are attracted to magnets and which are not?<br>• Can they notice that some forces need contact between two objects, but magnetic forces can act at a distance?<br>• Can they compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet?<br>• Can they identify some magnetic materials?<br>• Can they describe magnets have having two poles (N & S)?<br>• Can they predict whether two magnets will attract or repel each other depending on which poles are facing?<br>Can they investigate the strengths of different magnets and find fair ways to compare them? |
| **Vocabulary** | | contact forces, non-contact forces, up thrust, gravitational force, air resistance, water resistance, friction, magnetic force, Newtons, mechanism, accelerate | attract, repel, compass, magnetic field, magnetic, non-magnetic, electromagnet, |
| **Expectation of skills progression** | |  |  |

| Physics - Light | | | |
|---|---|---|---|
| | **Key Stage One** | **Lower Key Stage Two** | **Upper Key Stage Two** |
| **Substantive Knowledge** | • recognise that they need light in order to see things and that dark is the absence of light<br>• notice that light is reflected from surfaces<br>• recognise that light from the sun can be dangerous and that there are ways to protect their eyes<br>• 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 | • recognise that light appears to travel in straight lines<br>• 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<br>• 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 | |
| **Disciplinary Knowledge** | • Can they recognise that they need light in order to see things?<br>• Can they recognise that dark is the absence of light?<br>• Can they notice that light is reflected from surfaces?<br>• Can they recognise that light from the sun can be dangerous and that there are ways to protect their eyes?<br>• Can they recognise that shadows are formed when the light from a light source is blocked by a solid object?<br>• Can they find patterns in the way that the size of shadows change?<br>• Can they explain why lights need to be bright or dimmer according to need?<br>• Can they explain the difference between transparent, translucent and opaque?<br>• Can they explain why lights need to be bright or dimmer according to need?<br>• Can they make a bulb go on and off?<br>• Can they say what happens to the electricity when more batteries are added?<br>Can they explain why their shadow changes when the light source is moved closer or further from the object? | • Can they explain how light travels?<br>• Can they explain how the human eye sees objects?<br>• Can they explain how different colours of light can be created?<br>• Can they use and explain how simple optical instruments work? (periscope, telescope, binoculars, mirror, magnifying glass, Newton's first reflecting telescope)<br>• Can they explain changes linked to light (and sound)?<br>• Can they use the ray model to explain the size of shadows? | |
| **Vocabulary** | source, reflection, refraction, periscope, lens | reflection, periscope, filters, shadows | |
| **Expectation of skill progression** |  |  | |

| Physics - Electricity | | | |
|---|---|---|---|
| | **Key Stage One** | **Lower Key Stage Two** | **Upper Key Stage Two** |
| **Substantive Knowledge** | | | • associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit<br>• 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<br>• use recognised symbols when representing a simple circuit in a diagram<br>• identify common appliances that run on electricity<br>• construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers<br>• 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<br>• recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit<br>• recognise some common conductors and insulators, and associate metals with being good conductors |
| **Disciplinary Knowledge** | | | • Can they identify and name the basic parts of a simple electric series circuit? (cells, wires, bulbs, switches, buzzers)<br>• Can they compare and give reasons for variation in how components function, including bulb brightness, buzzer volume and on/off position of switches?<br>• Can they explain how to make changes in a circuit?<br>• Can they explain the impact of changes in a circuit?<br>• Can they explain the effect of changing the voltage of a battery?<br>• Can they identify common appliances that run on electricity?<br>• Can they construct a simple series electric circuit?<br>• Can they identify and name the basic part in a series circuit, including cells, wires, bulbs, switches and buzzers?<br>• Can they 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?<br>• Can they recognise that a switch opens and closes a circuit?<br>• Can they associate a switch opening with whether or not a lamp lights in a simple series circuit?<br>• Can they recognise some common conductors and insulators?<br>• Can they associate metals with being good conductors?<br><br>• Can they make their own traffic light system or something similar?<br>• Can they explain the danger of short circuits?<br>• Can they explain what a fuse is?<br>• Can they explain how a bulb might get lighter?<br>• Can they recognise if all metals are conductors of electricity?<br>• Can they work out which metals can be used to connect across a gap in a circuit?<br>• Can they explain why cautions are necessary for working safely with electricity?<br>• |
| **Vocabulary** | | | static electricity, static charge, electrical circuit, insulators, conductors, appliances, switch |

| Expectation of skills progression | | | |
|---|---|---|---|

# Knowledge Organiser • Electrical Circuits • Year 5

Electricity comes in two forms: static electricity and electricity in circuits.

## Static Electricity

**Happens when:**
two object rubs against each other

**Because:**
the positive and negative charge in a material become unbalanced

**Discharge:**
is when the charge jumps from one object to another to balance out again

**Examples:**

Rubbing a balloon on hair

Socks rubbing on a trampoline

Clothes spinning in a dryer

Storm clouds leading to lightning

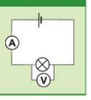
## Rules for building circuits

1. There must be at least one cell
2. There must be a complete loop for electricity to flow
3. The wires must be plugged in to each component on one side and come out of the component on the other side
4. The switch must be closed to make it work

## Taking measurements in a circuit

Current tells us how quickly electricity is flowing and is measured using an Ammeter.

Voltage tells us the amount of energy each component uses and is measured using a Voltmeter




When we want to show the parts of a circuit (known as components) we use a circuit diagram which shows the main features of a circuit in a simplified form.

| | | |
|---|---|---|
| Cell |  | What is commonly known as a 'battery' is a cell. Provides the power to make electricity flow. |
| Battery |  | When two or more cells are used together |
| Bulb |  | Produces light when electricity flows through it |
| Buzzer |  | Produces sound when electricity flows through it |
| Switch (open) |  | Creates a gap in the circuit to stop the flow of electricity |
| Switch (closed) |  | Closes the gap in the circuit to allow electricity to flow |

## Electrical insulators and conductors

Electrical insulator – an object or material that will not allow electricity to pass through itself easily.

Examples: plastic, wood, rubber, glass and oil

Electrical conductor – an object or material that will allow electricity to pass through itself easily.

Examples: include silver, gold, copper, graphite and sea water

## Adding cells or bulbs to a circuit

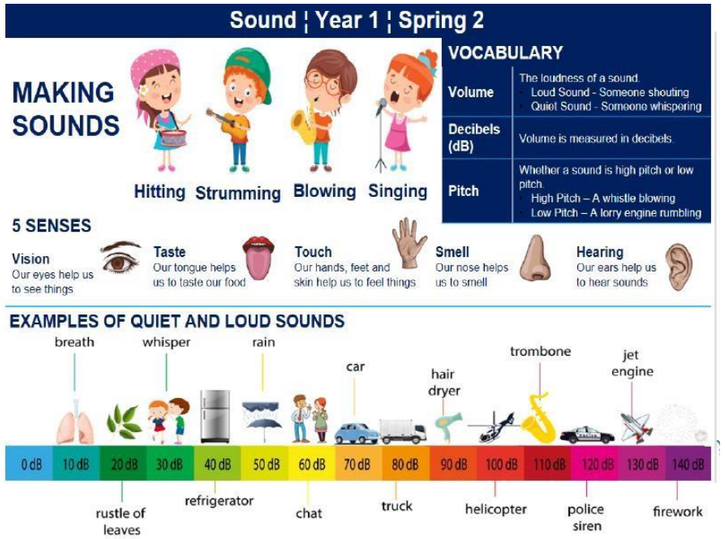
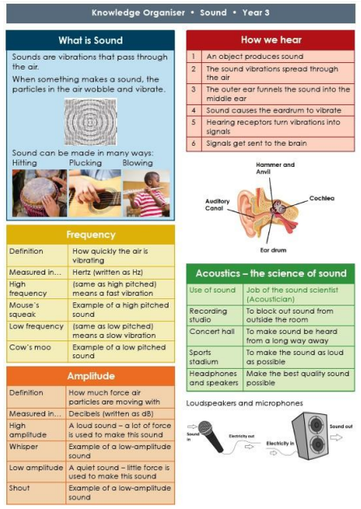
| Adding more BULBS to a circuit: | Adding more CELLS to a circuit: |
|---|---|
| • Bulbs are less bright | • Bulbs are brighter |
| • Current is lower | • Current is higher |
| • Voltage for each bulb is less | • Voltage for each bulb is more |

## Uses of buzzers

Buzzers enable sound to be made from electricity.

This can be useful for:

- Alarms - buzzers that go off when something is touched
- Electric doorbells - release a ringing sound when a button is pressed
- Shop door sensor - makes a noise when someone opens the door

| Physics - Sound | | | |
|---|---|---|---|
| | **Key Stage One** | **Lower Key Stage Two** | **Upper Key Stage Two** |
| **Substantive Knowledge** | • identify how sounds are made, associating some of them with something vibrating<br>• Know that sounds are measured in decibels.<br>• Know that the higher the decibels, the louder the sound.<br>• find patterns between the volume of a sound and the strength of the vibrations that produced it recognise that vibrations from sounds travel through a medium to the ear | • identify how sounds are made, associating some of them with something vibrating<br>• recognise that vibrations from sounds travel through a medium to the ear<br>• find patterns between the pitch of a sound and features of the object that produced it<br>• find patterns between the volume of a sound and the strength of the vibrations that produced it<br>• recognise that sounds get fainter as the distance from the sound source increases | |
| **Disciplinary Knowledge** | • Can they associate some sounds with something vibrating?<br>• Can they compare sources of sound and explain how the sounds differ?<br>• Can they explain how to change a sound (louder/softer)?<br>• Can they recognise how vibrations from sound travel through a medium to a ear?<br>• Can they find patterns between the pitch of a sound and features of the object that produce it?<br>• Can they find patterns between the volume of the sound and the strength of the vibrations that produced it? | • Can they associate some sounds with something vibrating?<br>• Can they compare sources of sound and explain how the sounds differ?<br>• Can they explain how to change a sound (louder/softer)?<br>• Can they recognise how vibrations from sound travel through a medium to a ear?<br>• Can they find patterns between the pitch of a sound and features of the object that produce it?<br>• Can they find patterns between the volume of the sound and the strength of the vibrations that produced it?<br>• Can they recognise that sounds get fainter as the distance from the sound source increases?<br>• Can they explain how you could change the pitch of a sound?<br>• Can they investigate how different materials can affect the pitch and volume of sounds?<br>• Can they explain why sound gets fainter or louder according to the distance?<br>• Can they explain how pitch and volume can be changed in a variety of ways?<br>• Can they work out which materials give the best insulation for sound? | |
| **Vocabulary** | decibels, pitch, volume, vibrate | frequency, amplitude, acoustics, Hertz, eco-location, percussion, | |
| **Expectation of skills progression** |  |  | |

| Physics – Earth and space | | | |
|---|---|---|---|
| | **Key Stage One** | **Lower Key Stage Two** | **Upper Key Stage Two** |
| **Substantive Knowledge** | • observe changes across the 4 seasons<br>• observe and describe weather associated with the seasons and how day length varies<br>• describe the movement of the Earth and other planets relative to the sun in the solar system<br>• name the planets in the solar system. | • describe the movement of the Earth and other planets relative to the sun in the solar system<br>• describe the movement of the moon relative to the Earth<br>• describe the sun, Earth and moon as approximately spherical bodies<br>use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky | |
| **Disciplinary Knowledge** | • Can they observe changes across the four seasons?<br>• Can they name the four seasons in order?<br>• Can they observe and describe weather associated with the seasons?<br>• Can they observe and describe how day length varies?<br>• Can they observe features in the environment and explain that these are related to a specific season?<br>• Can they observe and talk about changes in the weather?<br>• Can they talk about weather variation in different parts of the world?<br>• Can they define space?<br>• Can they say what is in space?<br>• Can they name some of the planets in our solar system?<br>• Can they describe how the Earth rotates and orbits the sun?<br>• Can they explain why the Earth is tilted?<br>• Can they talk about stars and constellations? | • Can they identify and explain the movement of the Earth and other plants relative to the sun in the solar system?<br>• Can they explain how seasons and the associated weather is created?<br>• Can they describe and explain the movement of the Moon relative to the Earth?<br>• Can they describe the sun, earth and moon as approximately spherical bodies?<br>• Can they use the idea of the earth's rotation to explain day and night and the apparent movement of the sun across the sky?<br>• Can they compare the time of day at different places on the earth?<br>• Can they create shadow clocks?<br>• Can they begin to understand how older civilizations used the sun to create astronomical clocks, e.g. Stonehenge?<br>Can they explore the work of some scientists? (Ptolemy, Alhazen, Copernicus) | |
| **Vocabulary** | sleet, hail, fog, season, summer, winter, autumn, spring, weather, hibernation, forecast constellations, universe, solar system, orbit, tilt, scientists | lunar, solar, eclipses, galaxies, astronomy, Milky Way, astronomer, heliocentric, geocentric, hemisphere, orbit, axis | |

Expectation of skills progression

# Seasons and The Weather ¦ Year 1 ¦ Spring 1


**SPRING** *March April May*
- trees grow leaves
- weather becomes warmer
- days become longer
- baby animals born

**SUMMER** *June July August*
- trees have full green leaves
- weather is usually warm
- days are bright and long

**AUTUMN** *September October November*
- leaves become brown and fall
- weather becomes more rainy and cold
- days become shorter
- animals prepare to hibernate

**WINTER** *December January February*
- no leaves on trees weather is cold and there can be snow
- days are dark and short
- animals hibernate

**WEATHER**

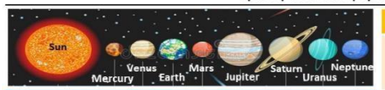
- **Rainy** — Water falling from clouds.
- **Cloudy** — Some clouds in the sky.
- **Snowy** — Snow falls from cold clouds.
- **Sunny** — The sun is shining brightly in the sky.
- **Stormy** — Thunder, lightning, wind and rain.
- **Foggy** — Clouds we can see. (FOG)

**KEY TERMS**

**Hibernation**
Animals sleep in the winter to survive the cold weather.


**Weather Forecast**
Shows the weather today and in the future.

# Space | Year Two | Spring 2




| Planets | Number from the Sun | Key features | Distance from the Sun (kilometres) |
|---|---|---|---|
| Mercury | 1 | Closest planet to the Sun. It turns very slowly on its axis. | 57 million |
| Venus | 2 | Brightest planet. It's air is 100% carbon dioxide. | 108 million |
| Earth | 3 | Where we live! Humans live on Earth. The only planet with liquid water. | 149 million |
| Mars | 4 | Known as the red planet because of the oxide in the land. | 483 million |
| Jupiter | 5 | The largest planet and it is very stormy there! | 778 million |
| Saturn | 6 | The second largest planet. It has 18 moons. | 1.4 billion |
| Uranus | 7 | The frozen planet because it is frozen. It has 27 moons. | 2.8 billion |
| Neptune | 8 | The gas giant because it is made of gas. | 4.4 billion |

| Keywords | |
|---|---|
| **Solar System** | The group of objects that orbit the sun. |
| **Orbit** | Goes around a planet or star. |
| **Axis** | An invisible line around which a planet spins. |
| **Rotate** | The way an object turns. |
| **Satellite** | A machine put into orbit around the Earth used for science or communications. |
| **NASA** | North American Space Agency |
| **Astronaut** | A person who travels in space. |

# Knowledge Organiser • Space • Year 4

## Vocabulary

| | |
|---|---|
| The Sun | The largest object in the solar system that the solar system was named after |
| Planets | Large spheres of rock that orbit around the sun |
| Moons | Large balls of rock that orbit planets |
| Asteroids, Meteorites, Comets | An example of another rocky object that can be found in the solar system |
| Dust and gas | Left over material from stars that have exploded in the past |

| Astrology | Astronomy |
|---|---|
| The belief that the motion of the stars and planets affects human lives | The scientific study of anything in space outside of the Earth's atmosphere |

A very hot ball of gas where nuclear fusion happens

**The Sun**

Inner rocky planets
- Closer to the Sun
- Mostly solid rock
- The warmer planets
- Smaller
- Take less time to orbit the sun

**Mercury**
**Venus**
**Earth**
**Mars**

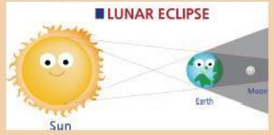
Outer gas giants
- Further away from the Sun
- Mostly made from gas
- The colder planets
- Often have rings of dust and rock around them
- Larger
- Take more time to orbit the sun

**Jupiter**
**Saturn**
**Uranus**
**Neptune**

## The universe and the Big Bang

| | |
|---|---|
| The universe | All the stars, planets, rocks and dust in space |
| Galaxy | A group of stars held together by gravity |
| Big Bang theory | The theory that all matter in the universe started in a single point that exploded outwards |
| Dwarf star | A smaller cooler star without nuclear fusion |
| Star colour | Hot stars are closer to blue, colder closer to red |

**Lunar eclipse**
When the Earth blocks the light from the Sun as the Moon moving into the Earth's shadow

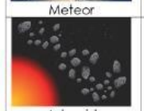



**Solar eclipse**
When the moon blocks the light from the sun to create a shadow on Earth



Meteor


Meteorite


Asteroid


Comet