



The Echelford Primary School - Science Progression Document

| Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
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| Working Scientifically <i>EYFS</i> <i>Key Stage 1 (Year 1 and 2)</i> <i>Lower Key Stage 2 (Year 3 and 4)</i> <i>Upper Key Stage 2 (Year 5 and 6)</i> | | | | | | |
| <p>Explores the natural world around him/her, making observations and drawing pictures of animals and plants</p> <p>Observe their surroundings and answer simple questions about what they have seen.</p> <p>Make predictions by asking simple questions about what they have observed and further this by identifying how they can find the answer.</p> <p>Begin to make comparisons about their environment</p> | <p>Perform simple tests with support. Can they describe what they hear, see, smell or taste to help them?</p> <p>Start to discuss what they have found out. Can they answer a question in different ways?</p> <p>Start to ask and suggest answers to simple scientific questions.</p> <p>Use first-hand practical experiences</p> | <p>Ask and raise their own scientific questions. Can they explain the reasons for this?</p> <p>Use first-hand practical experiences to find answers.</p> <p>Observe closely Can they find similarities, differences and use pattern-seeking to support these answers?</p> | <p>Ask relevant questions and use different types of scientific enquiries to answer them.</p> <p>Develop different types of scientific enquiry.</p> <p>Set up simple practical enquiries.</p> <p>Understand comparative and fair tests</p> <p>Develop skills of</p> | <p>Generate and answer scientific questions using evidence. Can they explain why they would use a certain type of enquiry, as opposed to another?</p> <p>Select most appropriate type of scientific enquiry</p> <p>Suggest, set up and carry out simple practical enquiries. Can they use their skills of: observation, pattern-seeking, grouping and classifying to create these enquiries?</p> <p>Confidently use a range</p> | <p>Recognise and control variables where necessary.</p> <p>Take measurements using a range of scientific equipment with accuracy and precision.</p> <p>Record data/results of increasing complexity using diagrams, classification keys, tables, bar and line graphs</p> <p>Independently decide which</p> | <p>Plan different types of scientific enquiry in order to answer questions</p> <p>Recognise and control variables where necessary.</p> <p>Explain which variables need to be controlled and why.</p> <p>Take measurements using a range of scientific equipment with accuracy and precision, taking repeat readings where appropriate. Can they identify why they have selected certain</p> |

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| <p>and how it might be different from another.</p> | <p>to find answers.</p> <p>Begin to gather and record data simply using pictures and words. Can they record this into a table or draw a picture?</p> <p>Start to observe closely. Can they use different equipment to observe?</p> <p>Begin to use simple equipment eg egg timers, hand lenses.</p> | <p>Perform simple tests Can they understand if the test is fair or not? Does their knowledge of describing what they can hear, see, smell or taste influence this?</p> <p>Use simple equipment eg hand lenses, egg timers</p> <p>Gather and record data using diagrams, words and charts. With support, can they identify the best way to record this data? (Text, diagrams, pictures, tables, simple graphs)?</p> <p>Discuss what they have found out.</p> | <p>systematic observation. Can they take accurate measurements using standard units? Can they use a range of equipment to do this?</p> <p>Gather, record and present data in variety of ways eg drawings, labelled diagrams, charts.</p> <p>Report on findings orally and in writing using scientific language.</p> <p>Use results to draw simple conclusions and make predictions.</p> <p>Identify similarities, differences, changes related to scientific processes and ideas.</p> | <p>of equipment to measure accurately eg data-loggers, thermometers.</p> <p>Gather, record, classify and present data in a wide variety of ways eg drawings, labelled diagrams, charts. Can they explain why they recorded it the way they did?</p> <p>Report on findings orally and in writing using scientific language to answer questions.</p> <p>Use results to draw simple conclusions, make predictions, suggest improvements and raise further questions.</p> <p>Explain similarities, differences, changes related to scientific processes and ideas.</p> <p>Make systematic observations</p> | <p>observations to make</p> <p>Use test results to make predictions to set up further tests (comparative/fair)</p> <p>Report and present findings from enquiries, examining causal relationships and reliability of results</p> <p>Use science experiences to plan different types of enquiry</p> <p>Identify scientific evidence that has been used to support/refute arguments</p> | <p>equipment? They can do this with increasing accuracy and take repeat readings when they feel it is necessary to do so.</p> <p>Record data and results of higher difficulty using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Can they explain the reasons why data would be recorded in different ways? Can they create and answer Scientific questions based on their evidence?</p> <p>Use test results to make predictions to set up further comparative and fair tests. Can they identify and classify links between results? Can they explain why they would use test results to further their enquiry?</p> |
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| | | | <p>Use range of equipment to measure accurately eg data-loggers, thermometers</p> | <p>Understand comparative and fair tests</p> | | <p>Report and present findings from enquiries, examining causal relationships and reliability of results. Can they can present this in oral and written forms? Can they explain why it needs to be presented in a certain way using relevant scientific language?</p> <p>Identify scientific evidence that has been used to support or refute ideas or arguments. Can they use their knowledge of primary and secondary sources to identify if the evidence is reliable and explain their reasons for this?</p> <p>Use science experiences to explore ideas and raise different types of question.</p> <p>Independently decide which observations to make.</p> |
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Plants

Skills Knowledge



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| <p>Explores the natural world around him/her, making observations and drawing pictures of plants</p> <p>Make observations of animals and plants and explain why some things occur</p> <p>Know the basic needs to help a plant grow.</p> <p>Sunlight and water are needed to make a plant grow.</p> <p>Use senses to explore and talk about plants.</p> <p>There are 5 senses: touch, smell, taste, hearing, sight.</p> <p>Describe what a plant looks like. Identify,</p> | <p>Identify and name a variety of everyday garden plants, including deciduous and evergreen trees.</p> <p>Deciduous is a tree or a shrub that sheds its leaves annually.</p> <p>For example: Oak tree, horse chestnut tree, beeches.</p> <p>Evergreen is a tree or shrub that stays green annually. For Example: Pine, Fir, Holly, Cedar.</p> <p>Identify and describe the basic structure of a variety of common flowering plants, including trees.</p> <p>The stem holds the plant upright The petals attract pollinators Roots are underground.</p> <p>Identify and describe</p> | <p>Observe and describe how seeds and bulbs grow into mature plants.</p> <p>Plants can grow from seeds or bulbs. Seedlings then grow into mature plants.</p> <p>Seeds germinate, then the stem grows up, roots grow down, a bud forms, leaves grow.</p> <p>Germinate means when a seed puts out shoots.</p> <p>Bud is the beginning of the flowering part of the plant.</p> <p>Find out and describe how plants need water, light and a suitable temperature to grow and stay</p> | <p>Explore and describe 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.</p> <p>All plants need: air, light, water, nutrients from soil, and room to grow. This may differ from plant to plant.</p> <p>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p> <p>Pollen is a fine powder that plants produced Pollination is the transference of</p> | | | |
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name and describe the basic structure of common plants, including garden plants and trees.

Parts of a plant could be: Stem, leaf, trunk, petal, roots, seeds.

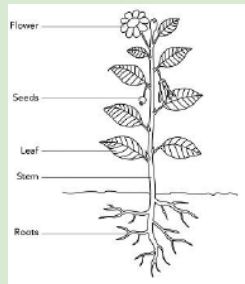
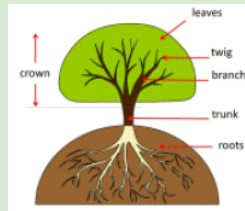
A tree is a type of plant

Make observations of plants and begin to explain why some things occur.

different flowers and begin to explain how these differ.

Example of common flowers: daisy, sunflower, rose, dandelion, buttercups. The differences could be: Size, shape, height, colour, where they grow, if they are wildflowers or need planting.

Observe closely the growth of flowers and vegetables to identify the change over time.



healthy.

Observe, record, compare similar plants at the same time of growth.

A plant needs light, water, space and a suitable temperature to grow.

pollen from one plant to another. A new seed is formed once a plant has been pollinated. Seed dispersal is the movement of seeds away from the parent plant. Seeds can be dispersed in different ways.

Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers

Leaves collect energy from the sun to make food. Roots collect water and nutrients and help the stability of the plant. Stems hold the plant up and bring the water and nutrients to the different parts of the plant. Flowers attract pollinators and produce the seeds. A pollinator is an animal that moves pollen.

Investigate the way in which water is transported within plants

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| | | | <p>Through their roots, plants absorb the water from the soil, which then travels up the plant through its water transport system.</p> <p>Observe, record and compare how the amount of different factors affect plant growth. E.g amount of light.---</p> | | | |
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Living Things



Skills

Knowledge

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| <p>Make observations of animals and plants and explain why some things occur</p> <p>Begin to understand what a life cycle is. Look at the life cycles of different animals and how they differ from each other.</p> <p>A life cycle is how a living thing changes through its life.</p> | | <p>Explore and compare the differences between things that are living, dead, and things that have never been alive.</p> <p>A living thing is something that moves, reproduces, is sensitive, excretes, needs nutrition, respire,</p> | | <p>Recognise that living things can be grouped in a variety of ways.</p> <p>Vertebrate animals can be put into groups such as fish, amphibians, reptiles, birds, and mammals; and invertebrates into snails and slugs, worms, spiders, and insects.</p> <p>A vertebrate is a living thing with a back bone.</p> | <p>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.</p> <p>The differences between a life cycle could be: the way they start, the number of stages and how the young look compared to the adult.</p> <p>Describe the life process of</p> | <p>Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals.</p> <p>Micro-organisms, more commonly</p> |
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Understand that we need to take care of living things.

If we do not take care of living things, they will die before their natural time.

Begin to understand what a life cycle is. Look at the life cycles of different animals and how they differ from each other. Observe how life cycles differ between animals.

grows.

A dead thing is something that used to be living.

Something that has never been alive has never been living.

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.

A habitat is a place where a living thing lives and grows.

A habitat needs to: provide the right food and nutrition, provide shelter, provide safety. This will vary between species.

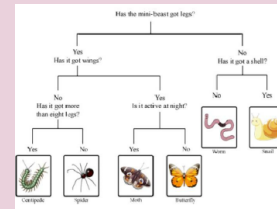
Animals breathe oxygen and exhale carbon dioxide. Plants take in carbon dioxide and release oxygen back into the air.

Identify and name a

An invertebrate does not have a backbone.

Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.

A classification key is a series of questions that determine an organism's physical characteristics.



Recognise that environments can change and that this can sometimes pose dangers to living things.

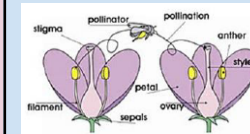
If environments change quickly the animals living in that habitat may not have time to adapt to survive the changes

There can be natural and human changes to an environment.

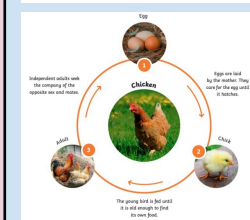
Explore how humans can have a positive and negative impact on our environment.

reproduction in some plants and animals.

Plant reproduction is either sexual or asexual. Sexual reproduction involves two organisms. Asexual reproduction involves one parent.



Children might observe changes in an animal over a period of time (for example, by hatching and rearing chicks) and comparing how different animals reproduce and grow.



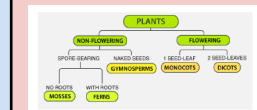
known as 'germs', 'bugs' or 'microbes', are tiny living things too small to be seen with the naked eye.

Living things have certain common characteristics — they need food, they respire and, excrete, respond to their environment, reproduce, grow and show movement.

Give reasons for classifying plants and animals based on specific characteristics.

Know that micro-organisms, plants and animals can be subdivided.

Sub-groups include: Kingdom, Phylum, Class, Order, Family, Genus and species.



Research key scientists who are pioneers in classification.

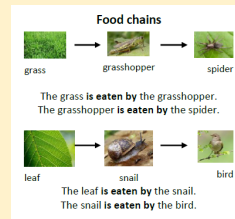
Scientists may include: Aristotle,

variety of plants and animals in their habitats, including microhabitats.

A microhabitat is a small area habitat within another habitat

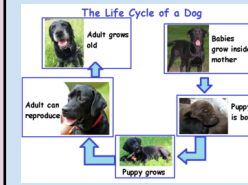
Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.

A food chain shows how plants and animals get their energy. They include producers and consumers.



Humans can cause littering and deforestation which can have a negative impact on the environment.

Positive changes are: nature reserves, ecologically planned parks and garden ponds.



Find out about the work of naturalists and animal behaviourists, for example: David Attenborough and Jane Goodall.

David Attenborough - a natural historian and broadcaster who has introduced millions of people to a variety of animals from around the world. He is also an important climate change campaigner.

Jane Goodall -a British scientist who has studied chimpanzees for many years. She is considered to be the world expert on chimpanzees and their behaviour.

Carl Linnaeus, Malaika Vaz, Agnus Arber, Beatrix Potter, Hu Xiansu, Charles Darwin.

Animals, including humans



Skills
Knowledge

Explores the natural world around him/her, making observations and drawing pictures of animals and plants

Make observations of animals and plants and explain why some things occur

Identify, name, draw and label the basic parts of the human body. Know what each part of the body is used for linking to senses

The main parts of the body are:
Head
Neck
Arms
Elbows
Legs
Knees
Face
Ears (Sound)
Eyes (Sight).

Know what is needed to be clean and healthy.

To be clean means to wash/ body and hair regularly, brush your teeth, and wash

Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.

A mammal is warm-blooded, gives birth to live animals, has a type of fur/hair.

A reptile is cold blooded, has scales, lays eggs.

An amphibian lives in and out of water, webbed feet, lay eggs and moist skin.

A bird is warm-blooded, has feathers, a beak, wings, lays eggs and can typically fly.

A fish is cold-blooded, has gills, has fins, lives in the water and lays eggs.

Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets).

A pet is an animal that

Understand that animals, including humans, have offspring which grow into adults.

Offspring means: live young.

Offspring grows in the following sequence: babies - toddlers - children - adolescent - adult - elderly.

The length of each of these stages vary between different species.

Describe the basic needs of animals, including humans, for survival (water, food and air).

Things animals and humans need to survive are: Water, food, air, shelter and space for growth.

Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

It is important to

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.

Nutrition is the taking in and use of food and other nourishing material by the body.

Your body can not produce its own food and nutrients.

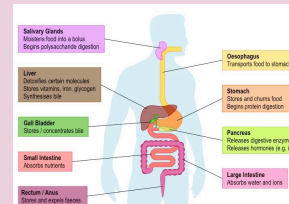


Identify that humans and some other animals have skeletons and muscles for support, protection and movement.

A skeleton is the framework of bones that

Describe the simple functions of the basic parts of the digestive system in humans.

Digestion is how the body breaks down food so it can be taken and used.

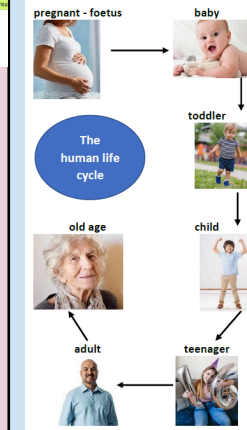


1. Digestion starts when the teeth start to break the food down. Saliva is added and the tongue rolls the food into a ball.
2. The food is swallowed and passes down the oesophagus to the stomach. Here the food is broken down further by being churned around and other chemicals are added.
3. The food passes into the small intestine. Here nutrients are removed from the food and leave the digestive system to be used elsewhere in the body
4. The rest of the food then passes into the large intestine. Here the water is removed for use

Describe the changes as humans develop to old age.

Old age is the final stage of development for humans.

The life cycle of a human is foetus - babies - toddlers - children - adolescent -early adulthood, adulthood - older adult.



Research the gestation periods of other animals and compare them with humans. Children may find out and record the length and mass of a baby as it grows.

A gestation period is the time between egg

Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.

The heart pumps blood in the blood vessels to the lungs where oxygen goes into the blood and carbon dioxide is removed.

The blood goes to the heart.

It is then pumped around the body so that water, nutrients and oxygen are transported in the blood to the muscles and other parts of the body where they are needed. As all these are used, they produce carbon dioxide and other waste products.

Carbon dioxide is carried by the blood in blood vessels back to the heart.

The cycle starts again as the Carbon Dioxide is

hands throughout the day.

Hygiene means maintaining health through being clean - the way we care for our bodies.

To be healthy means to make healthy food choices, get enough rest, and exercise regularly.

Name, describe and categorise a variety of common animals including fish, reptiles, birds, carnivores and herbivores.

Categorise means to sort into related groups.

A carnivore is an animal that mainly eats meat.

A herbivore only eats plants.

A bird is warm-blooded, has feathers, a beak, wings, lays eggs and can typically fly.

A fish is cold-blooded, has gills, has fins, lives in the water and lays eggs.

is domesticated.

Identify and name animals that are carnivores, herbivores and omnivores.

A carnivore is an animal that mainly eats meat.

A herbivore only eats plants.

An omnivore eats both meat and plants.

Animals are classified into groups.



Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense

The main parts of the body are:
Head
Neck
Arms

exercise because keep our bodies healthy. It helps build and maintain healthy bones and muscles.



Green - Vitamins and minerals (Fruit and Vegetables)
Yellow - Carbohydrates
Blue - Dairy
Pink - Protein
Purple - Oils and healthy fats

Hygiene is important to prevent disease and infection.

supports and protects the soft tissues and the internal organs of the body.



Muscles lie under the skin, made up of long threads and fibres. Their function provides the tug on the bones needed to bend, straighten and support joints.

Where one bone meets another we have a joint; these are essential for movement. Where there are joints, muscles control the movement

elsewhere in the body.

Identify the different types of teeth in humans and their simple functions.

Molars are large, square teeth with a rough edge at the back of your mouth, used for grinding and chewing food. Canines are the pointy teeth beside your incisors they help tear food. Incisors are the eight front centre teeth used to bite into your food.



Construct and interpret a variety of food chains, identifying producers, predators and prey.

A food chain shows how energy from the sun is used by animals in a chain from plants through to animals and even humans.

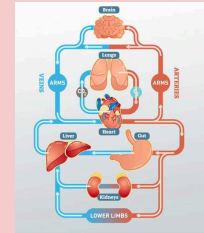
A producer is something that makes their own food.

A predator is an animal that hunts or prey on other animals.

fertilisation and birth.

Animals have different gestation periods.

transported back to the lungs to be removed from the body.



Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.

Prescribed drugs can be used to keep your body healthy.

Recreational drugs such as alcohol and nicotine can damage your health.

Describe the ways in which nutrients and water are transported within animals, including humans.

Nutrients and water are absorbed in the system in the stomach, small and large intestines. They enter the blood stream via the capillaries where they

A reptile is cold blooded, has scales, lays eggs.

Know what some animals eat.

Some animals eat meat, some animals only eat plants and some animals eat plants and meat.

Talk about where animals can be found.

Animals' homes are called habitats.

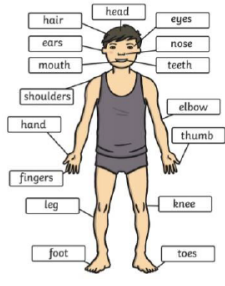
Animals can be found in many different places around the world.






- Elbows
- Legs
- Knees
- Face
- Ears (Sound)
- Eyes (Sight)
- Hair
- Mouth (Taste)
- Teeth
- Nose (Smell)
- Skin (Touch)

Understand how to take care of animal habitats taken from the local environments.

Animals should remain in their natural habitat.

Parts of the human body



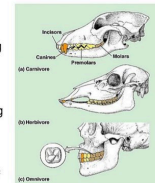
| Sense | Part of the body it is linked to |
|-------|--|
| touch |  fingers, hands, feet etc |
| sight |  eyes |
| smell |  nose |
| taste |  tongue |
| hear |  ears |

Prey is an animal that is hunted by another animal for food. Prey are hunted by predators.

Compare carnivore, omnivore and herbivore teeth. What is different about them? Can you tell if something is a predator by the type of teeth they have?

Teeth

- **Carnivore**
 - sharp ripping teeth
 - "canines"
- **Herbivore**
 - wide grinding teeth
 - molars
- **Omnivore**
 - both kinds of teeth



are passed through to the arteries

Materials



Skills
Knowledge

Children know about similarities and differences in relation to materials.

Materials may be soft, hard. For example glass is a hard and smooth material. Whereas, a sponge is a soft and rough material.

Recognise and identify some everyday materials.

Everyday materials are materials we use on a regular basis and might encounter every day. This includes wood, plastic, glass, metal, water, and rock.

They know the properties of some materials and can suggest some of the purposes they are used for.

Some materials are

Distinguish between an object and the material from which it is made.

An object is something that you can touch.

A material is what the object is made from.

An object is a thing that is made of one or more materials.

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.

Materials have different physical properties e.g. hard,

Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses

Each material can be used to make a range of different things; for example, wood can be used to make tables, chairs, spoons, pencils, shoes, doors, floors and many more things.

Find out and describe how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

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.

Soluble - when a material is put in water it 'disappears'. E.g. salt in water.

Insoluble – when a material is put in water it stays as a solid.

Conductors - Some materials let electricity pass through them easily. These materials are known as electrical conductors. It is called a thermal conductor when the material allows heat to pass through very easily.

Insulator - Materials

hard, others are soft.

Hard materials are used in cutting tools, machines and construction materials. Soft materials can be used for foams, plastics, gels.

strong, flexible, not flexible, soft, stretchy, rough, smooth, shiny, transparent, opaque.

Transparent means completely see through, translucent lets some light through but is not completely see through and opaque means you cannot see through.

Compare and group together a variety of everyday materials on the basis of their simple physical properties

Absorbent - different types of materials which can soak up liquid.



Waterproof - Something that keeps water out is waterproof.



Squashing, Bending, Twisting and Stretching



that do not allow electricity to pass through them are called electrical insulators.

Transparency - light completely passes through an object, and you can see clearly through it.

Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution

Dissolve - When a soluble solid (solute) is mixed with a suitable liquid (solvent), it forms a solution. This process is called dissolving.

A solution is a mixture of two or more substances that stays evenly mixed. Substances that are combined to form a solution do not change into new substances.

Demonstrate that dissolving, mixing and changes of state are reversible changes

Dissolving - when a solid mixes with a

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| | | | | | <p>liquid to form a solution of the two materials.</p> <p>Mixing - A mixture is a physical combination of two or more substances that aren't chemically joined. For example, water and salt are separate substances that once mixed, create a mixture - seawater</p> <p>Changes of state - the process of one state of matter (solid, liquid or gas) changing to another.</p> <p>Reversible changes - when materials can be changed back to how they were before the reaction took place. E.g. When ice melts to form water. It could be frozen back to ice again.</p> <p>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.</p> <p>Filtering - Filtration is the process of separating solids from liquids using filter paper</p> | |
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| | | | | | <p>Sieving - removing particles of insoluble or undissolved material from a liquid, usually by using a barrier with small to medium-sized holes.</p> <p>Evaporating - the change in state when a liquid (e.g. water) changes to a gas (e.g. water vapour).</p> <p>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</p> <div data-bbox="1547 770 1794 1185"> <p>uses and properties of materials</p> <p>conductor ↔ material that allows heat or electricity through</p> <p>insulator → material that does not allow heat, electricity or sound through very well</p> <p>hardness how easily a material can be scratched</p> <p>solubility ☒ how well a substance mixes into a liquid</p> <p>transparency ←--- how see-through a material is</p> <p>☐ transparent ☐ translucent ☐ opaque</p> <p>magnetism ☑ when a material is attracted by magnetic force</p> </div> <p>Explain that some changes result in the formation of new materials, and that this kind of change</p> | |
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| | | | | | <p>is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.</p> <p>Irreversible changes - A change is called irreversible if it cannot be changed back again. In an irreversible change, new materials are always formed.</p> | |
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Seasonal Changes



Skills

Knowledge

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| <p>Understands some important processes and changes in the natural world around him/her, including the seasons</p> <p>Begin to identify the four seasons.</p> <p>There are four seasons in a year – Spring, Summer, Autumn and Winter.</p> <p>Looks closely at</p> | <p>Observe change across the four seasons.</p> <p>Four seasons are formed in one Year due to the earth travelling around the sun.</p> <p>Autumn - September, October, November Winter - December, January, February Spring - March, April, May Summer - June, July, August</p> | | | | | |
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similarities, differences, patterns and changes in relation to the four seasons and when different weather occurs.

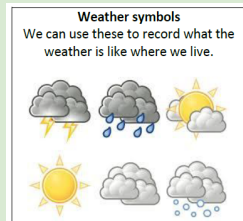
It is warm in the summer, it is cold in the winter.



Observe and describe weather associated with the seasons and how day length varies.

The longest day of the year in the UK is in mid-summer.
This falls on June 21st.
This is the Summer Solstice.

The shortest day of the year in the UK is in mid-winter.
This falls on December 21st. This is the Winter Solstice.

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| Autumn | <ul style="list-style-type: none">• Temperatures get progressively colder• The weather is very changeable• 12 hours of light per day on average |
| Winter | <ul style="list-style-type: none">• Temperatures are at their coldest• The weather is generally wet, windy and cloudy at the start of the season becoming drier and much colder in the later part of the season• 8 hours of light per day on average |
| Spring | <ul style="list-style-type: none">• Early spring can be quite cold and occasionally the lowest temperatures of the year can occur in March• 13 hours of light per day on average |
| Summer | <ul style="list-style-type: none">• The warmest and sunniest of the seasons• Thunderstorms are more likely in the Summer• 16 hours of light per day on average |



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| Rocks | | | | | | |
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| Skills Knowledge | | | | | | |
| <p>Fossils are the remains of a dinosaur or plant that has been preserved by nature.</p> <p>An archaeologist is a person who studies things that were left behind in the past.</p> <p>Dinosaur fossils have been discovered along the Jurassic Coast in Dorset.</p> | | | <p>Recognise that soils are made from rocks and organic matter.</p> <p>Soil is made from small rocks and other organic matter.</p> <p>Describe simply how fossils are formed when things that have lived are trapped within rock.</p> <p>Fossils are formed when things that have lived (eg; animals, leaves) are trapped within a rock and are left for a sustained period of time.</p> <p>Compare and group together different kinds of</p> | | | |

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| | | | <p>rocks on the basis of their appearance and simple physical properties.</p> <p>A variable is something that can be changed in an experiment.</p> <p>One way rocks can be organised is 'X'. Rocks can also be organised by size, colour, and whether they are sedimentary, igneous or metamorphic.</p> <div data-bbox="1003 730 1220 849" data-label="Diagram"> <p>The diagram is titled "Types of Rocks" and shows three categories: Igneous rocks, Sedimentary rocks, and Metamorphic rocks. Each category has a small image of a rock sample below it.</p> </div> | | | |
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Light



Skills Knowledge

Observe and name some sources of everyday light.

Examples include:

Notice that light is reflected from surfaces.

To be reflective a

Recognise that light appears to travel in straight lines.

Light travels in a

electric lights, flames and the Sun.

surface needs to be smooth, shiny and flat.

Recognise that we need light in order to see things and that dark is the absence of light.

Recognise that light from the sun can be dangerous and that there are ways to protect eyes.

The sun has powerful rays that can be dangerous if you look directly at it.

You can protect your eyes from the sun by: not looking at it directly, wearing sunglasses and a sun hat.

Find patterns in the way that the size of shadows change.

The closer and object to the source of light, the bigger shadow as more

straight line as it passes through a transparent substance. But when it moves from one transparent material to another of different density—for example, from air to water or from glass to air—it bends at the interface (where the two surfaces meet). This bending is called refraction.

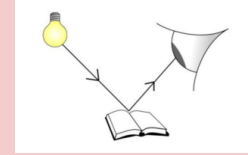
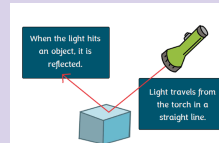
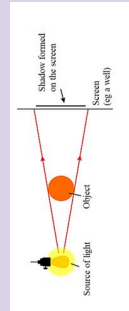
Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye

Reflection is when light hits the surface of an object and then that light travels to our eyes so we can see. The reflected light from objects is absorbed by our eyes to form images of the world around us.

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.

light is blocked.

Recognise that shadows are formed when the light from a light source is blocked by a solid object.



Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them

Shadows resemble the shape, but are not necessarily the same size as the object that makes them. The distance and position of the light source from an object affect the size of a shadow. A shadow will get bigger if the light source is moved closer to the object, or if the object moves away from its shadow.

Use further observation skills to extend their experience of light by looking at a range of phenomena including rainbows, colours on soap bubbles, objects looking bent in water and coloured filters.

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| | | | | | | <p>A phenomenon is an observable event or, quite literally, something that can be seen. Phenomenon can also mean a "surprising development".</p> |
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Forces and Magnets



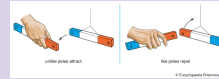
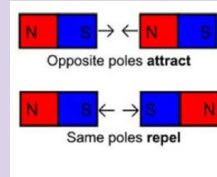
Skills

Knowledge

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| <p>Talk about and describe movement. E.g squashing, rolling, pushing etc.</p> <p>Squashing - pressed or crushed with force.</p> <p>Rolling - To move by turning over and over.</p> <p>Pushing - the force that moves an object away from something,</p> | | | <p>Compare how things move on different surfaces.</p> <p>Friction - a force between two surfaces that are sliding, or trying to slide, across each other.</p> <p>The smoother the surface, the less friction there is. The rougher the surface, the more friction there is.</p> <p>Notice that some forces need contact between</p> | | <p>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.</p> <p>Gravity - a force that pulls everything down toward the centre of the Earth. Gravity also pulls any object with mass toward each other. E.g. the Earth and the Moon or the Moon and the Sun.</p> <p>Friction is force between two surfaces that are sliding, or trying to slide across</p> | |
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| | | | <p>two objects, but magnetic forces can act at a distance.</p> <p>Magnetism works over a distance. They don't need to be touching. The space around a magnet has attracting and repelling forces. These are strongest at the poles of the magnets.</p> <p>Describe magnets as having two poles.</p> <p>Magnets have two ends. We call these their north pole and south pole.</p> <p>Observe how magnets attract or repel each other and attract some materials and not others.</p> <p>When two of the same poles are placed close together they repel (push apart) each other. When two different poles are close, they attract</p> | | <p>each other.</p> <p>Identify the effects of air resistance, water resistance and friction that act between moving surfaces.</p> <p>Air resistance - the frictional force air exerts against a moving object. As an object moves, air resistance slows it down.</p> <p>Water resistance - a type of force that uses friction to slow things down that are moving through water. It is often called drag.</p> <p>Pupils should explore falling objects and raise questions about the effects of air resistance.</p> <p>The faster an object falls, the bigger the air resistance and so the slower it falls. Air resistance makes an object fall at a slower speed and reach the ground later than it would in a vacuum.</p> <p>Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force</p> | |
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(pull together) each other.



Compare and group some materials on the basis of whether or not they are attracted to a magnet, and identify some magnetic materials.

Magnetic materials are always made of metal, but not all metals are magnetic. Iron is magnetic, so any metal with iron in it will be attracted to a magnet. Steel contains iron, so a steel paperclip will be attracted to a magnet too. Most other metals, for example aluminium, copper and gold, are NOT magnetic.

to have a greater effect.

Mechanisms - devices that we create to help us. Most mechanisms are designed to change smaller input forces and motion into greater output force and motion.

Pulleys - a simple machine that makes it easier to lift or move a heavy object. It includes at least one wheel and a length of rope.

Levers - they have only two parts — the handle and the fulcrum. The handle or bar of the lever is called the "arm" — it's the part that you push or pull on. The "fulcrum" is the point on which the lever turns or balances.

Gears - wheels with teeth that slot together. When one gear is turned the other one turns as well. If the gears are of different sizes, they can be used to increase the power of a turning force.

Pupils might find out how scientists, for

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| | | |  <p>Predict whether two magnets will attract or repel each other, depending on which poles are facing.</p> <p>If two like poles, e.g. two north poles, are brought together they will push away from each other – repel. If two unlike poles, e.g. a north and south, are brought together they will pull together – attract.</p> | | <p>example, Galileo Galilei and Isaac Newton helped to develop the theory of gravitation.</p> <p>Galileo Galilei's theory - two objects of the same size but slightly different mass hit the ground at the same time if they are dropped from the same height.</p> <p>Isaac Newton described gravity as a pulling force that keeps people on the ground rather than floating off. He also noted that gravity keeps the moon in orbit. Newton told the story of seeing an apple fall to the ground from a tree which inspired him to wonder why it fell down, rather than up or across.</p> | |
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States of Matter



Skills
Knowledge

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| Understands some important processes and | | | | Compare and group materials together, according to whether | | |
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changes in the natural world around him/her, including changing states of matter

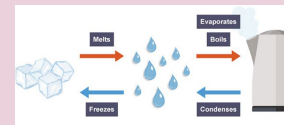
they are solids, liquids or gases.

Solids have a fixed shape and fixed volume, which means they don't move to fill a container when they're placed in it. They hold their own shape and volume

The shape of a liquid does change, it is not rigid. It fits the shape of the container it is put in. Liquids flow. They also have a fixed volume.

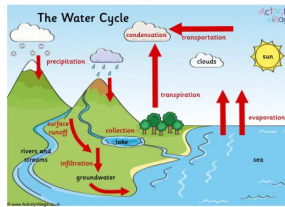
Gases do not have a shape, they completely fill any container they are put into. They do not have a fixed volume.

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 ($^{\circ}\text{C}$).



We take the temperature of things using a thermometer.

Identify the part played by evaporation and condensation in the

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| | | | | <p>water cycle and associate the rate of evaporation with temperature.</p>  | | |
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Sound



Skills

Knowledge

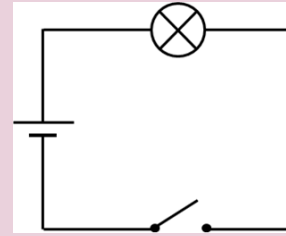
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| <p>Observe and explore a variety of sounds.</p> <p>Different objects make sounds</p> <p>You use your ears to hear sound.</p> <p>Explore how sounds can be changed.</p> <p>Sound can be loud or quite</p> | | | | <p>Identify how sounds are made, associating some of them with something vibrating.</p> <p>Sound is caused by vibration. If an object vibrates the air particles called molecules close to it vibrate</p> <p>Recognise that vibrations from sounds travel through a medium to the ear.</p> <p>A medium is any material that sound can travel through, this includes a liquid, a solid or a gas.</p> | | |
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| | | | | <p>The vibrations make the medium around vibrate and these vibrations enter your ear, the brain hears these and turns them into a sound.</p> <p>Find patterns between the pitch of a sound and features of the object that produced it.</p> <p>The shorter the object the higher the pitch, the longer the object the lower the pitch.</p> <p>Find patterns between the volume of a sound and the strength of the vibrations that produced it</p> <p>The size of the vibration (also called amplitude) determines the volume. The louder the sound the larger the vibration. This is known as amplitude which carries the energy.</p> <p>Recognise that sounds get fainter as the distance from the sound source increases.</p> <p>As the sound waves travel outwards from the original source the wave carries less energy</p> | | |
| Electricity | | | | | | |



Skills
Knowledge

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| | | | | <p>Identify common appliances that run on electricity.</p> <p>Some examples of common appliances that run on electricity are:</p> <ul style="list-style-type: none">• Kettle• Refrigerator• Microwave• Dishwasher• Toaster.• Shower• Tumble Dryer• Washing Machine <p>Mains electricity is the electricity that is delivered to homes and businesses through an electric grid.</p> <p>A battery is a device that can store electricity.</p> <p>Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.</p> | | <p>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.</p> <p>The brightness of the lamp and the volume of a buzzer (power) depends on two factors: The voltage and the current which flows through it.</p> <p>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.</p> <p>How components function may vary based on the: amount of batteries in the circuit, arrangement of the equipment in the circuit, the number of</p> |
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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.

As the current passes through the lamp, it makes it light up. The components are connected end-to-end, one after the other. If the lamp is not connected to the circuit, it will not light up.

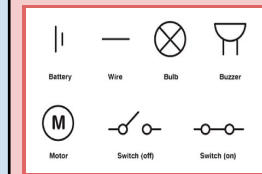
Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.

A switch can be used to turn the current in a circuit on and off. Flipping on a lamp switch closes its circuit. This allows current to flow freely and the lamp to light up. Turning off the switch breaks, or opens, the circuit—the flow of

bulbs/buzzers added into a circuit, whether the switch is on or off.

Reasons may include: amount of batteries in the circuit, arrangement of the equipment in the circuit, the number of bulbs/buzzers added into a circuit, whether the switch is on or off.

Use recognised symbols when representing a simple circuit in a diagram.



current stops and the lamp shuts off.

Recognise some common conductors and insulators, and associate metals with being good conductors.

Conductors - Some materials let electricity pass through them easily. These materials are known as electrical conductors. It is called a thermal conductor when the material allows heat to pass through very easily.

Insulator - Materials that do not allow electricity to pass through them are called electrical insulators.

Examples of conductors include metals, aqueous solutions of salts (i.e., ionic compounds dissolved in water), graphite, and the human body.

Examples of insulators include plastics, Styrofoam, paper, rubber, glass and dry air.

Earth and Space



Skills

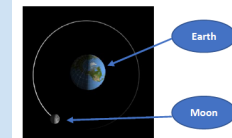
Knowledge

Describe the movement of the Earth, and other planets, relative to the Sun in the solar system


A planet moves around the sun in a circular path for which the gravitational force of attraction on the planet by the sun provides the necessary centripetal force. This centripetal force is always directed towards the centre of the sun at each point of its path which is responsible for circular motion of planet.


Describe the movement of the Moon relative to the Earth.

The moon orbits Earth in an oval-shaped path whilst it spins on its axis.



At different times in the month the moon appears to be different shapes, this is

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| | | | | | <p>because the sun lights up different parts of the moon as the moon moves around the Earth.</p>  <p>Describe the Sun, Earth and Moon as approximately spherical bodies.</p> <p>A planet's gravity pulls equally from all sides. Gravity pulls from the centre to the edges like the spokes of a bicycle wheel. This makes the overall shape of a planet a sphere.</p> <p>Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</p> <p>Earth rotates (spins) on its axis, it does a full spin once every 24 hours, which is our day and night. Daytime occurs when the side of the Earth is facing</p> | |
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| | | | | | <p>the sun and night occurs when the side of the Earth is facing away from the sun.</p> <p>Pupils should learn that the Sun is a star at the centre of our solar system and that it has eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune (Pluto was reclassified as a 'dwarf planet' in 2006)</p>  | |
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Evolution and Inheritance



Skills
Knowledge

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| | | | | | | <p>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.</p> <p>A fossil is the</p> |
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| | | | | | | <p>preserved remains or traces of a dead organism. The process by which a fossil is formed is called fossilisation.</p> <p>After an animal dies, the soft parts of its body decompose leaving the hard parts, like the skeleton, behind. This becomes buried by small particles of rock called sediment.</p> <p>As more layers of sediment build up on top, the sediment around the skeleton begins to compact and turn to rock.</p> <p>The bones then start to be dissolved by water seeping through the rock. Minerals in the water replace the bone, leaving a rock replica of the original bone called a fossil.</p> <p>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.</p> <p>When living things reproduce they pass</p> |
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on characteristics to their offspring. This is known as inheritance.

There are some key characteristics that we inherit from our birth parents. These include your eye colour, skin colour, shape of your ears and whether you can roll your tongue or not.

We don't inherit everything from our parents. For example, things like hairstyles, scars and ear piercings are not passed on.

Different offspring from the same parents don't inherit the same mix of characteristics. These differences are called variation.

Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

Evolution explains how the living things on our planet today have slowly developed from

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| | | | | | | <p>simpler life forms that lived millions of years ago.</p> <p>Can they talk about the work of Charles Darwin, Mary Anning and Alfred Wallace (Pioneers in evolution)?</p> <p>Charles Darwin observed that although individuals in a species shared similarities, they were not exact copies of each other; there were small differences or variations between them. He also noticed that everything in the natural world was competing to survive. The winners were those which adapted or adjusted their characteristics to increase their chance of survival in the environment they were in.</p> <p>Mary Anning was a fossil collector and palaeontologist Anning became famous for her finds made in Jurassic marine fossil beds. Some of Mary Anning's discoveries</p> |
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| | | | | | | <p>include the Ichthyosaur, the Plesiosaur and the Dimorphodon.</p> <p>Alfred Wallace noticed distinct differences between areas where certain animals were found. Wallace concluded that species adapted and changed to suit their environment, passing on their characteristics to their offspring. If a species couldn't adapt, it would die out.</p> |
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