CurriculumPRO

Everyday Materials

Hide

10 Programmes of study, 10 skills and 15 knowledge statements

Year 1 | Driver subject | Science | Gather & record data | Identify & classify | Investigation | Measurement | Observation | Physical things | Properties and uses | Questioning | Report and conclude

Y1 **Ask simple questions and recognise that they can be answered in different ways.**

Skill

Core knowledge

- Question words include what, why, how, when, who and which.

Broad knowledge

Question words include what, why, how, when, who and which.

Y1 **Observe closely, using simple equipment.**

Skill

Broad knowledge

Simple equipment is used to take measurements and observations. Examples include metre sticks, measuring tapes, egg timers and hand lenses.

Y1 **Perform simple tests.**

Skill

Core knowledge

- Simple tests can be carried out by following a set of instructions.

Broad knowledge

Simple tests can be carried out by following a set of instructions.

Y1 **Identify and classify.**

Skill

Broad knowledge

Objects, materials and living things can be looked at and compared.

Y1 **Use their observations and ideas to suggest answers to questions.**

Skill

Core knowledge

- Results are information that has been found out from an investigation.

Broad knowledge

The results are information that has been found out from an investigation.

Hinterland

Materials are all around us, such as in the home, garden, school and park. Materials are important because we use them to make everyday objects.

Y1 **Gather and record data to help in answering questions.**

Skill

Broad knowledge

Data can be recorded and displayed in different ways, including tables, pictograms and drawings.

Hinterland

A Venn diagram is a way of grouping information or objects using overlapping circles.

Y1 **Distinguish between an object and the material from which it is made.**

Skill

Core knowledge 3

- A material is what an object is made from.
- Everyday materials include wood, plastic, glass, metal, water, rock, brick, paper and fabric.

Broad knowledge

A material is what an object is made from. Everyday materials include wood, plastic, glass, metal, water, rock, brick, paper and fabric.

Hinterland

Natural materials come from the world around us, such as the ground, plants and animals. Natural materials include wood, metal, cotton, wool, leather, stone, rubber, clay, silk, oil, water and sand.

Hinterland

People make new materials from natural materials. These materials are called human-made materials. Examples of human-made materials include glass, paper, plastic, brick, metal alloys, synthetic fabrics and concrete. Human-made materials look and feel different to the natural materials they are made from.

Y1 **Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.**

Skill

Core knowledge 3

- A material is what an object is made from.
- Everyday materials include wood, plastic, glass, metal, water, rock, brick, paper and fabric.

Broad knowledge

A material is what an object is made from. Everyday materials include wood, plastic, glass, metal, water, rock, brick, paper and fabric.

Hinterland

Natural materials come from the world around us, such as the ground, plants and animals. Natural materials include wood, metal, cotton, wool, leather, stone, rubber, clay, silk, oil, water and sand.

Hinterland

People make new materials from natural materials. These materials are called human-made materials. Examples of human-made materials include glass, paper, plastic, brick, metal alloys, synthetic fabrics and concrete. Human-made materials look and feel different to the natural materials they are made from.

Y1 **Describe the simple physical properties of a variety of everyday materials.**

Skill

Core knowledge 2

- Materials have different properties, such as hard or soft; stretchy or stiff; rough or smooth; opaque or transparent; bendy or rigid; waterproof or not waterproof.

Broad knowledge

Materials have different properties, such as hard or soft; stretchy or stiff; rough or smooth; opaque or transparent; bendy or rigid; waterproof or not waterproof.

Hinterland

A property is a quality a material has. A material's properties make it suitable for a particular use.

Y1 **Compare and group together a variety of everyday materials on the basis of their simple physical properties.**

Skill

Core knowledge 2

- A property is a quality a material has.
- Materials with different properties have different uses.

Broad knowledge

Materials can be grouped according to their properties.

Hinterland

The properties of a material determine its uses. For example, a transparent and waterproof material could be used for a windowpane.

Shade and Shelter

Hide

2 Programmes of study, 2 skills and 1 knowledge statement

Year 1 | Driver subject | Design and technology | Identify & classify

Y1 **Distinguish between an object and the material from which it is made.**

Skill

Core knowledge

- A material is what an object is made from.
- Everyday materials include wood, plastic, glass, metal, water, rock, brick, paper and fabric.

Broad knowledge

A material is what an object is made from. Everyday materials include wood, plastic, glass, metal, water, rock, brick, paper and fabric.

Y1 **Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.**

Skill

Core knowledge

- A material is what an object is made from.
- Everyday materials include wood, plastic, glass, metal, water, rock, brick, paper and fabric.

Broad knowledge

A material is what an object is made from. Everyday materials include wood, plastic, glass, metal, water, rock, brick, paper and fabric.

Human Senses

Hide

10 Programmes of study, 10 skills and 14 knowledge statements

Year 1 | Driver subject | Science | Gather & record data | Human body | Identify & classify | Investigation | Measurement | Observation | Parts and functions | Questioning | Report and conclude | Staying safe

Y1 **Ask simple questions and recognise that they can be answered in different ways.**

Skill

Core knowledge

- Question words include what, why, how, when, who and which.

Broad knowledge

Question words include what, why, how, when, who and which.

Hinterland

Sensory loss or impairment is when one of the senses, including sight, hearing, smell, touch, or taste, is not working as expected or as it should. Some sensory loss or impairment examples include deafness, blindness, visual impairment or hearing impairment.

Y1 **Observe closely, using simple equipment.**

Skill

Broad knowledge

Simple equipment is used to take measurements and observations. Examples include metre sticks, measuring tapes, egg timers and hand lenses.

Y1 **Perform simple tests.**

Skill

Core knowledge

- Simple tests can be carried out by following a set of instructions.

Broad knowledge

Simple tests can be carried out by following a set of instructions.

Y1 **Identify and classify.**

Skill

Broad knowledge

Objects, materials and living things can be looked at and compared.

Y1 **Use their observations and ideas to suggest answers to questions.**

Skill

Core knowledge

- Results are information that has been found out from an investigation.

Broad knowledge

The results are information that has been found out from an investigation.

Hinterland

Our senses keep us safe from danger. For example, our sense of touch feels when something is hot, making us move away from the heat source.

Hinterland

Humans are living things. They belong to a group of animals called mammals. All animals, including humans, use their senses, breathe, feed, sleep, get rid of waste, grow and move to stay alive. Humans are the same in that they have the same body parts. Humans are different in that they have different sexes, hair colours, eye colours and heights, for example.

Y1 **Gather and record data to help in answering questions.**

Skill

Broad knowledge

Data can be recorded and displayed in different ways, including tables, pictograms and drawings.

Y1 **Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.**

Skill

Core knowledge

- Humans are living things. They belong to a group of animals called mammals.
- Humans normally have the same body parts.
- Humans look different from each other.

Broad knowledge

Animals are living things. Animals can be sorted and grouped into six main groups: fish, amphibians, reptiles, birds, invertebrates and mammals.

Y1 **Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets).**

Skill

Core knowledge

- Different animal groups have some common body parts.

Broad knowledge

Different animal groups have some common body parts, such as eyes and a mouth, and some different body parts, such as fins or wings.

Y1 **Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.**

Skill

Core knowledge

- The basic body parts are the head, arms, legs, nose, eyes, ears, mouth, hands and feet.

Broad knowledge

The basic body parts are the head, arms, legs, nose, eyes, ears, mouth, hands and feet. The five senses are hearing, sight, smell, taste and touch. Ears are used for hearing, eyes are used to see, the nose is used to smell, the tongue is used to taste and skin gives the sense of touch.

Hinterland

Every human body is made up of different body parts.

Y1 **Develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics.**

Skill

Core knowledge

- Ways to stay safe include: using sun cream and wearing and hat in the Sun; stopping, looking and listening when crossing the road; not touching sharp or hot objects; only eating or drinking what you know or have been given by an adult you trust.

Broad knowledge

It is important to stay safe. Some ways to stay safe include staying safe in strong sunlight (sun cream, sun hat and sunglasses), crossing roads (stop, look and listen), in the kitchen (not touching hot or sharp objects) and with household chemicals (not touching, drinking or eating).

Bright Lights, Big City

1 Programme of study, 1 skills and 1 knowledge statement

Year 1 | Driver subject | Geography | Observation

Y1 **Identify and classify.**

Skill

Broad knowledge

Objects, materials and living things can be looked at and compared.

Seasonal Changes

Hide

11 Programmes of study, 14 skills and 23 knowledge statements

Year 1 | Driver subject | Science | Changes | Earth | Forces | Gather & record data | Habitats | Identify & classify | Investigation | Living things | Measurement | Observation | Pattern seeking | Questioning | Report and conclude | Staying safe

Y1 **Ask simple questions and recognise that they can be answered in different ways.**

Skill

Core knowledge

- Question words include what, why, how, when, who and which.

Broad knowledge

Question words include what, why, how, when, who and which.

Hinterland

A rain gauge is a piece of equipment used for measuring rainfall in millimetres (mm).

Y1 **Observe closely, using simple equipment.**

Skill

Broad knowledge

Simple equipment is used to take measurements and observations. Examples include metre sticks, measuring tapes, egg timers and hand lenses.

Hinterland

The Sun provides Earth with heat and light. However, it gives out invisible rays that can damage our skin and eyes over time.

Hinterland

UV beads change colour when exposed to UV light. They are good as an indicator of potentially damaging rays from the Sun.

Hinterland

Temperature is the measure of how hot or cold something is. It is measured using a thermometer on many different scales, including degrees Celsius.

Y1 **Perform simple tests.**

Skill

Core knowledge

- Simple tests can be carried out by following a set of instructions.

Broad knowledge

Simple tests can be carried out by following a set of instructions.

Y1 **Identify and classify.**

Skill

Broad knowledge

Objects, materials and living things can be looked at and compared.

Y1 **Use their observations and ideas to suggest answers to questions.**

Skill

Core knowledge

- Results are information that has been found out from an investigation.

Broad knowledge

The results are information that has been found out from an investigation.

Hinterland

A weather forecast predicts the weather, including the temperature, the type of weather, the chance of precipitation and the strength of the wind for a specific place and time.

Skill

Core knowledge

- The local environment is a habitat for living things and can change during the seasons.

Broad knowledge

The local environment is a habitat for living things and can change during the seasons.

Y1 **Gather and record data to help in answering questions.**

Skill

Broad knowledge

Data can be recorded and displayed in different ways, including tables, pictograms and drawings.

Y1 **Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.**

Skill

Core knowledge

- Plants are living things.
- Trees are large, woody plants and are either evergreen or deciduous. Trees that lose their leaves in the autumn are called deciduous trees.

Broad knowledge

Plants are living things. Common plants include the daisy, daffodil and grass. Trees are large, woody plants and are either evergreen or deciduous. Trees that lose their leaves in the autumn are called deciduous trees. Examples include oak, beech and rowan. Trees that shed old leaves and grow new leaves all year round are called evergreen trees. Examples include holly and pine.

Y1 **Observe changes across the four seasons.**

Skill

Core knowledge 2

- The four seasons are spring, summer, autumn and winter.
- Certain events and weather patterns happen in different seasons.

Broad knowledge

There are four seasons: spring, summer, autumn and winter. Certain events and weather patterns happen in different seasons.

Hinterland

In winter, the weather can be cold and frosty. Days are short. Deciduous trees are bare, and animals are less active. In spring, days begin to lengthen. The weather is changeable. Trees grow leaves and blossom, and plants start to grow. Animal life is more active, and baby animals are visible. In summer, days are long. There is abundant growth of plants and animals. The weather is warm and sunny with some rain. In autumn, days begin to shorten. The weather is cool and often wet and windy. Some leaves change colour, and plants die off. Animals are active and preparing for winter. The pattern of the seasons is repeated every year.

Y1 **Observe and describe weather associated with the seasons and how day length varies.**

Skill

Core knowledge

- Day length is the number of hours of daylight.
- Day length is longer in the summer months and shorter in the winter months in the UK.

Broad knowledge

Day length (the number of daylight hours) is longer in the summer months and shorter in the winter months.

Hinterland

The length of daytime in winter in the UK is shorter because the Northern Hemisphere is tilted away from the Sun. The length of daytime in summer is longer because the Northern Hemisphere is tilted towards the Sun.

Skill

Core knowledge

- Wind strength is measured by the Beaufort Scale.

Broad knowledge

Different types of weather include sunshine, rain, hail, wind, snow, fog, lightning, storm and cloud. The weather can change daily and some weather types are more common in certain seasons, such as snow in winter.

Y1 **Develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics.**

Skill

Core knowledge

- Using sun cream and wearing a hat helps you to stay safe in the Sun.

Broad knowledge

It is important to stay safe. Some ways to stay safe include staying safe in strong sunlight (sun cream, sun hat and sunglasses), crossing roads (stop, look and listen), in the kitchen (not touching hot or sharp objects) and with household chemicals (not touching, drinking or eating).

Y1 **Develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them.**

Skill

Core knowledge

- Deciduous trees change across the four seasons.

Core knowledge

- Changes happen to animals across the four seasons.

Broad knowledge

All living things (plants and animals) change over time as they grow and mature.

Hinterland

Apple trees are deciduous. In winter, branches are bare and develop buds. In spring, buds open as leaves or blossom and fruit starts to grow. In summer, apples grow quickly and ripen. In autumn, apples are ready to be harvested.

Hinterland

In spring, many animals give birth to young or lay eggs that hatch. In summer, animals eat a lot of food, and young animals grow and learn to look after themselves. In autumn, animals eat or collect lots of food and make nests and shelters to prepare for winter. In winter, animals protect themselves from the cold weather by hibernating, migrating or spending time in their nests.

Skill

Core knowledge
- Simple equipment can be used for measuring weather including windsocks, thermometers and rain guages.

Broad knowledge

Simple equipment can be used for measuring weather, such as measuring temperature with a thermometer; identifying wind direction and force with a windsock or measuring rainfall with a rain gauge.

Plant Parts

Hide

9 Programmes of study, 10 skills and 16 knowledge statements

Year 1 | Driver subject | Science | Gather & record data | Habitats | Identify & classify | Living things | Measurement | Observation | Parts and functions | Questioning | Report and conclude | Survival

Y1 **Ask simple questions and recognise that they can be answered in different ways.**

Skill

Core knowledge
- Question words include what, why, how, when, who and which.

Broad knowledge

Question words include what, why, how, when, who and which.

Hinterland

Plants are important because they provide food, shelter and materials for animals, including humans.

Y1 **Observe closely, using simple equipment.**

Skill

Broad knowledge

Simple equipment is used to take measurements and observations. Examples include metre sticks, measuring tapes, egg timers and hand lenses.

Hinterland

Parts of a leaf include the margin, blade, veins and stalk. Leaves can be simple, palmate, compound, lobed or needle-like.

Y1 **Identify and classify.**

Skill

Broad knowledge

Objects, materials and living things can be looked at and compared.

Y1 **Use their observations and ideas to suggest answers to questions.**

Skill

Broad knowledge

The results are information that has been found out from an investigation.

Skill

Core knowledge
- The local environment is a habitat for living things and can change during the seasons.

Broad knowledge

The local environment is a habitat for living things and can change during the seasons.

Y1 **Gather and record data to help in answering questions.**

Skill

Broad knowledge

Data can be recorded and displayed in different ways, including tables, pictograms and drawings.

Y1 **Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.**

Skill

Core knowledge
- Plants are important because they provide food, shelter and materials for animals, including humans.

Core knowledge
- The leaves of most deciduous trees are wide and flat.
- The leaves of most evergreen trees are thin and pointed.

Broad knowledge

Plants are living things. Common plants include the daisy, daffodil and grass. Trees are large, woody plants and are either evergreen or deciduous. Trees that lose their leaves in the autumn are called deciduous trees. Examples include oak, beech and rowan. Trees that shed old leaves and grow new leaves all year round are called evergreen trees. Examples include holly and pine.

Hinterland

Plants grow from seeds or bulbs and need water and sunlight to grow. Plants grow in different places like gardens, meadows, woodlands and hedgerows. Garden plants are looked after by people. Wild plants are not looked after by people.

Hinterland

Deciduous trees usually have broad, flat leaves. Evergreen usually have thin, needle-like leaves.

Y1 **Identify and describe the basic structure of a variety of common flowering plants, including trees.**

Skill

Core knowledge
- The basic plant parts include root, stem, leaf, flower, petal and fruit.

Core knowledge
- Plants grow from seeds or bulbs.

Broad knowledge

The basic plant parts include root, stem, leaf, flower, petal, fruit, seed and bulb. Trees have a woody stem called a trunk.

Hinterland

Plants grow from seeds or bulbs. There is a tiny plant inside a seed or bulb that grows when the conditions are optimal. Seeds are smaller than bulbs and come in various shapes, sizes and colours. Bulbs are larger than seeds and typically have a rounded shape and papery coating.

Y1 **Develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics.**

Skill

Core knowledge

- Living things need to be cared for in order for them to survive.
- Living things need water, food, warmth and shelter.

Broad knowledge

Living things need to be cared for in order for them to survive. They need water, food, warmth and shelter.

Y1 **Develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them.**

Skill

Core knowledge

- Changes happen to plants as they grow and mature.

Core knowledge

- Changes happen to plants across the four seasons.

Broad knowledge

All living things (plants and animals) change over time as they grow and mature.

Hinterland

In winter, many plants and trees are dormant and have buds on their branches. In spring, leaves and blossom appear on trees and smaller plants begin to grow and flower.

Chop, Slice and Mash

1 Programme of study, 1 skills and 1 knowledge statement

Year 1 | Driver subject | Design and technology | Healthy lifestyle

Y1 **Are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.**

Skill

Core knowledge

- Hand washing and good hygiene prevent the spread of germs.

Broad knowledge

Hand washing and good hygiene are important parts of a healthy lifestyle and prevent the spread of germs.

Animal Parts

Hide

10 Programmes of study, 10 skills and 16 knowledge statements

Year 1 | Driver subject | Science | Gather & record data | Identify & classify | Investigation | Measurement | Nutrition | Observation | Parts and functions | Questioning | Report and conclude | Survival

Y1 **Ask simple questions and recognise that they can be answered in different ways.**

Skill

Broad knowledge

Question words include what, why, how, when, who and which.

Y1 **Observe closely, using simple equipment.**

Skill

Broad knowledge

Simple equipment is used to take measurements and observations. Examples include metre sticks, measuring tapes, egg timers and hand lenses.

Y1 **Perform simple tests.**

Skill

Core knowledge

- Simple tests can be carried out by following a set of instructions.

Broad knowledge

Simple tests can be carried out by following a set of instructions.

Y1 **Identify and classify.**

Skill

Broad knowledge

Objects, materials and living things can be looked at and compared.

Y1 **Use their observations and ideas to suggest answers to questions.**

Skill

Broad knowledge

The results are information that has been found out from an investigation.

Y1 **Gather and record data to help in answering questions.**

Skill

Broad knowledge

Data can be recorded and displayed in different ways, including tables, pictograms and drawings.

Hinterland

Data can be sorted and displayed in a Carroll diagram. A Carroll diagram sorts information into a table using 'yes or no' questions.

Y1 **Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.**

Skill

Core knowledge 3

- Animals are living things.
- Fish, amphibians, reptiles, birds, invertebrates and mammals are groups of animals.

Broad knowledge

Animals are living things. Animals can be sorted and grouped into six main groups: fish, amphibians, reptiles, birds, invertebrates and mammals.

Hinterland

Animals come in a wide variety of shapes and sizes. All animals are born and grow and change over time. They have senses, breathe, move, eat, get rid of waste and have offspring.

Hinterland

Animals are sorted into six main groups based on their common characteristics. For example, all birds have a beak, two wings and two legs and feathers.

Y1 **Identify and name a variety of common animals that are carnivores, herbivores and omnivores.**

Skill

Core knowledge 2

- Carnivores eat other animals (meat), herbivores eat plants and omnivores eat other animals and plants.

Broad knowledge

Carnivores eat other animals (meat), herbivores eat plants and omnivores eat other animals and plants.

Hinterland

Carnivores have features to help them hunt and eat other animals, such as eyes on the front of their heads and sharp teeth. Herbivores have features to help them eat plants and keep them safe from other animals, such as flat, sharp teeth and eyes on the sides of their heads. Omnivores have features of both carnivores and herbivores.

Hinterland

A Venn diagram shows the relationship between groups of things using overlapping circles.

Y1 **Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets).**

Skill

Core knowledge

- Different animal groups have some common body parts.

Broad knowledge

Different animal groups have some common body parts, such as eyes and a mouth, and some different body parts, such as fins or wings.

Y1 **Develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics.**

Skill

Core knowledge 2

- Living things need to be cared for in order for them to survive.
- Living things need water, food, warmth and shelter.

Broad knowledge

Living things need to be cared for in order for them to survive. They need water, food, warmth and shelter.

Hinterland

A pet is an animal that humans keep at home as a companion, such as a rabbit. Pets come from different animal groups and need different things to keep them healthy.

Human Survival

Hide

9 Programmes of study, 9 skills and 17 knowledge statements

Year 2 | Driver subject | Science | Gather & record data | Healthy lifestyle | Human body | Investigation | Measurement | Observation | Questioning | Report and conclude | Staying safe

Y2 **Ask simple questions and recognise that they can be answered in different ways.**

Skill

Core knowledge

- Questions can help us find out about the world.

Broad knowledge

Questions can help us find out about the world.

Y2 **Observe closely, using simple equipment.**

Skill

Broad knowledge

Simple equipment is used to take measurements and observations. Examples include timers, hand lenses, metre sticks and trundle wheels.

Y2 **Perform simple tests.**

Skill

Core knowledge 3

- Tests can be carried out by following a set of instructions.
- A prediction is a best guess at what might happen in an investigation.

Broad knowledge

Tests can be carried out by following a set of instructions. A prediction is a guess at what might happen in an investigation.

Hinterland

There are four types of exercise: aerobic, strengthening, stretching and balancing.

Hinterland

Germs make humans ill. They get into the body through the eyes, nose or mouth. Washing hands with soap and clean running water helps humans avoid getting ill and spreading germs to others.

Hinterland

Germs spread from person to person through direct or indirect contact.

Y2 **Identify and classify.**

Skill

Broad knowledge

Objects, materials and living things can be looked at, compared and grouped according to their features.

Y2 **Use their observations and ideas to suggest answers to questions.**

Skill

Core knowledge

- Results from an investigation can be used to answer a question.

Broad knowledge

The results are information that has been found out from an investigation and can be used to answer a question.

Hinterland

Humans are living things. They belong to an animal group called mammals. All humans have the same body parts that have specific functions. Humans have five senses: hearing, sight, smell, taste and touch. Humans are omnivores. There are six stages of human life: baby, toddler, child, teenager, adult and elderly person.

Y2 **Gather and record data to help in answering questions.**

Skill

Core knowledge

- A timeline is a linear diagram.
- A life cycle is a circular diagram.

Broad knowledge

Data can be recorded and displayed in different ways, including tables, charts, pictograms and drawings.

Y2 **Notice that animals, including humans, have offspring which grow into adults.**

Skill

Core knowledge 2

- Humans grow from baby to toddler to child to teenager to adult to elderly.

Broad knowledge

Human offspring go through different stages as they grow to become adults. These include baby, toddler, child, teenager, adult and elderly.

Hinterland

A human life cycle starts with an embryo inside the female. After birth, the juvenile stage is the second stage of the human life cycle. Juveniles grow over time to become adults. Adults reproduce to start the life cycle again.

Hinterland

A timeline is a linear diagram. A life cycle is a circular diagram.

Y2 **Find out about and describe the basic needs of animals, including humans, for survival (water, food and air).**

Skill

Core knowledge

- Humans need water, food, air and shelter to survive.

Broad knowledge

Humans need water, food, air and shelter to survive.

Y2 **Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.**

Skill

Core knowledge 2

- A healthy lifestyle includes exercise, a balanced diet, good quality sleep and personal hygiene.

Core knowledge

- Risks associated with an unhealthy lifestyle include illness, obesity, tooth decay and mental health problems.
- Germs are microorganisms that can cause illness in humans.
- Germs get into the body through the eyes, nose or mouth.
- Washing hands with soap and clean running water helps humans avoid getting ill and spreading germs to others.

Broad knowledge

A healthy lifestyle includes exercise, good personal hygiene, good quality sleep and a balanced diet. Risks associated with an unhealthy lifestyle include obesity, tooth decay and mental health problems.

Hinterland

A balanced diet includes food from the five main food groups: fruit and vegetables, carbohydrates, proteins, dairy and alternatives and oils and spreads. Some people eat a mixed, omnivorous diet, some eat a vegetarian diet, and some eat a vegan diet.

Hinterland

Germs are microorganisms that can cause illness in humans.

Remarkable Recipes

1 Programme of study, 1 skills and 1 knowledge statement

Year 2 | Driver subject | Design and technology | Identify & classify

Y2 **Develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them.**

Skill

Broad knowledge

Some foods, such as ice and chocolate, melt when heated, but then harden (solidify or freeze) when cooled.

Habitats

Hide

9 Programmes of study, 9 skills and 16 knowledge statements

Year 2 | Driver subject | Science | Gather & record data | Habitats | Identify & classify | Investigation | Nutrition | Observation | Physical things | Questioning | Survival

Y2 **Ask simple questions and recognise that they can be answered in different ways.**

Skill

Core knowledge

- Questions can help us find out about the world.

Broad knowledge

Questions can help us find out about the world.

Y2 **Perform simple tests.**

Skill

Broad knowledge

Tests can be carried out by following a set of instructions. A prediction is a guess at what might happen in an investigation.

Y2 **Identify and classify.**

Skill

Broad knowledge

Objects, materials and living things can be looked at, compared and grouped according to their features.

Hinterland

Prey animals have different ways to avoid capture by predators. Some use speed to outrun predators; some have body parts that can be used as weapons; some use bright colours to warn predators that they are poisonous; others use body parts to shield themselves from attack. Some prey animals use mimicry to look like other, more dangerous animals; others use camouflage to blend into their surroundings and hide from predators.

Hinterland

Plants have adaptations that protect them from being eaten by animals. Some plants grow sharp spines; some have thorns on their stems; and others have hairs covering their stems and leaves to stop insects from eating them. Some plants have prickly leaves; some have stings; and others produce poisonous chemicals. Other plants camouflage themselves so animals do not see them as food, while others provide homes for other animals that provide protection from predators.

Y2 **Gather and record data to help in answering questions.**

Skill

Core knowledge

- A timeline is a linear diagram.
- A life cycle is a circular diagram.

Broad knowledge

Data can be recorded and displayed in different ways, including tables, charts, pictograms and drawings.

Hinterland

Animals eat food that is found in their habitat. Herbivores eat plants. Omnivores eat plants and animals. Carnivores eat animals.

Y2 **Explore and compare the differences between things that are living, dead, and things that have never been alive.**

Skill

Core knowledge 2

- Living things are those that are alive. Dead things are those that were once living but are no longer. Some things have never been alive.
- The seven life processesof living things are moving, breathing, using their senses, feeding, getting rid of waste, having offspring and growing.

Broad knowledge

Living things are those that are alive. Dead things are those that were once living but are no longer. Some things have never been alive.

Hinterland

Living things carry out the seven life processes: moving, breathing, using their senses, feeding, getting rid of waste, having offspring and growing. Non-living things include things that have lived and are now dead, such as dead plants and animals, and things that have never lived, such as rocks and water. They do not carry out any life processes.

Y2 **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.**

Skill

Core knowledge 2

- A habitat is a place where plants and animals live.
- Local habitats include parks, woodland and gardens. Habitats beyond the locality include beaches, rainforests, deserts, oceans and mountains.
- A habitat provides food, water, shelter and space.

Broad knowledge

Local habitats include parks, woodland and gardens. Habitats beyond the locality include beaches, rainforests, deserts, oceans and mountains. All living things live in a habitat to which they are suited and it must provide everything they need to survive.

Hinterland

A habitat is a place where plants and animals live. Habitats contain both living and non-living things. Habitats provide everything living things need to survive, including food, water, shelter and space.

Y2 **Identify and name a variety of plants and animals in their habitats, including microhabitats.**

Skill

Core knowledge 2

- A habitat is a place where plants and animals live.
- A microhabitat is a very small habitat.

Broad knowledge

A habitat is a place where a living thing lives. A microhabitat is a very small habitat.

Hinterland

Unknown plants and animals in a habitat can be identified by observing their physical features and comparing them with pictures or descriptions on a spotting sheet or guide.

Y2 **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.**

Skill

Core knowledge 2

- Food chains show how living things depend on one another for food. Plants always start a food chain because they are producers that make their own food using sunlight.

Broad knowledge

Food chains show how living things depend on one another for food. All food chains start with a plant, followed by animals that either eat the plant or other animals.

Hinterland

Plants always start a food chain because they are producers that make their own food using sunlight. Energy from food is transferred from plants to animals, and between animals, within a habitat. Arrows in a food chain mean 'is eaten by.'

Y2 **Find out about and describe the basic needs of animals, including humans, for survival (water, food and air).**

Skill

Broad knowledge

Animals need water, food, air and shelter to survive. Their habitat must provide all these things.

Coastline

1 Programme of study, 1 skills and 1 knowledge statement

Year 2 | Driver subject | Geography | Forces

Y2 **Develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them.**

Skill

Core knowledge

- Some objects float and others sink.

Broad knowledge

Some objects float and others sink. Objects that float are typically light or hollow. Objects that sink are typically heavy or

Uses of Materials

Hide

8 Programmes of study, 8 skills and 14 knowledge statements

Year 2 | Driver subject | Science | Changes | Gather & record data | Investigation | Measurement | Observation | Properties and uses | Questioning | Report and conclude

Y2 **Ask simple questions and recognise that they can be answered in different ways.**

Skill

Core knowledge 2

- Questions can help us find out about the world.

Broad knowledge

Questions can help us find out about the world.

Hinterland

Earth provides natural resources, and humans need to ensure that these resources do not run out. Sustainability is looking after Earth for the future. We can live more sustainably by reducing, reusing and recycling.

Hinterland

Recycling is making old, used materials into new objects. Symbols are printed on some packaging to tell us whether or not they can be recycled.

Y2 **Observe closely, using simple equipment.**

Skill

Broad knowledge

Simple equipment is used to take measurements and observations. Examples include timers, hand lenses, metre sticks and trundle wheels.

Y2 **Perform simple tests.**

Skill

Core knowledge 2

- Tests can be carried out by following a set of instructions.
- A prediction is a best guess at what might happen in an investigation.

Broad knowledge

Tests can be carried out by following a set of instructions. A prediction is a guess at what might happen in an investigation.

Hinterland

Whether a material can be bent, stretched, twisted or squashed can determine its uses. For example, clay will bend, stretch, twist and squash, and it won't return to its original shape, making it ideal for sculpting.

Y2 **Identify and classify.**

Skill

Broad knowledge

Objects, materials and living things can be looked at, compared and grouped according to their features.

Y2 **Use their observations and ideas to suggest answers to questions.**

Skill

Core knowledge 2

- Results from an investigation can be used to answer a question.

Broad knowledge

The results are information that has been found out from an investigation and can be used to answer a question.

Hinterland

Paper is made from wood. There are many types of paper, such as printer paper, newsprint and cardboard. Different paper types have different properties that make them suitable for specific purposes.

Y2 **Gather and record data to help in answering questions.**

Skill

Broad knowledge

Data can be recorded and displayed in different ways, including tables, charts, pictograms and drawings.

Y2 **Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.**

Skill

Core knowledge 2

- A material's physical properties make it suitable for particular purposes, such as glass for windows and brick for building walls.
- Objects can be made from one material, more than one material or different materials with similar properties.

Broad knowledge

A material's physical properties make it suitable for particular purposes, such as glass for windows and brick for building walls. Many materials are used for more than one purpose, such as metal for cutlery and cars.

Hinterland

Objects can be made from one material, more than one material or different materials with similar properties.

Y2 **Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.**

Skill

Core knowledge

- Some objects and materials can be changed by squashing, bending, twisting, stretching, heating, cooling, mixing and being left to decay.

Broad knowledge

Some objects and materials can be changed by squashing, bending, twisting, stretching, heating, cooling, mixing and being left to decay.

Hinterland

Bending is pulling or pushing a material until it is no longer straight. Stretching is pulling or pushing a material to make it thinner, longer or wider. Twisting is turning a material until it makes a spiral shape. Squashing is pushing a material so that it becomes flatter.

Plant Survival

Hide

10 Programmes of study, 10 skills and 13 knowledge statements

Year 2 | Driver subject | Science | Gather & record data | Habitats | Identify & classify | Investigation | Living things | Measurement | Observation | Parts and functions | Questioning | Report and conclude

Y2 **Ask simple questions and recognise that they can be answered in different ways.**

Skill

Core knowledge

- Questions can help us find out about the world.

Broad knowledge

Questions can help us find out about the world.

Y2 **Observe closely, using simple equipment.**

Skill

Broad knowledge

Simple equipment is used to take measurements and observations. Examples include timers, hand lenses, metre sticks and trundle wheels.

Y2 **Perform simple tests.**

Skill

Core knowledge

- Tests can be carried out by following a set of instructions.

*A prediction is a best guess at what might happen in an investigation.

Broad knowledge

Tests can be carried out by following a set of instructions. A prediction is a guess at what might happen in an investigation.

Y2 **Identify and classify.**

Skill

Broad knowledge

Objects, materials and living things can be looked at, compared and grouped according to their features.

Hinterland

Many plants grow from seeds or bulbs. Different plants grow in different habitats and change with the seasons. Plants have roots, stems, leaves, flowers and fruit. Trees have roots, a trunk, bark, branches and leaves.

Y2 **Use their observations and ideas to suggest answers to questions.**

Skill

Core knowledge

- Results from an investigation can be used to answer a question.

Broad knowledge

The results are information that has been found out from an investigation and can be used to answer a question.

Hinterland

A bulb contains a tiny plant and all the food needed to grow. Spring bulbs can start to grow in winter when the ground is frozen.

Y2 **Gather and record data to help in answering questions.**

Skill

Core knowledge

- A timeline is a linear diagram.
- A life cycle is a circular diagram.

Broad knowledge

Data can be recorded and displayed in different ways, including tables, charts, pictograms and drawings.

Y2 **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.**

Skill

Core knowledge

- A habitat is a place where plants and animals live.
- Local habitats include parks, woodland and gardens. Habitats beyond the locality include beaches, rainforests, deserts, oceans and mountains.
- A habitat provides food, water, shelter and space.

Broad knowledge

Local habitats include parks, woodland and gardens. Habitats beyond the locality include beaches, rainforests, deserts, oceans and mountains. All living things live in a habitat to which they are suited and it must provide everything they need to survive.

Y2 **Identify and name a variety of plants and animals in their habitats, including microhabitats.**

Skill

Core knowledge

- A habitat is a place where plants and animals live.
- A microhabitat is a very small habitat.

Broad knowledge

A habitat is a place where a living thing lives. A microhabitat is a very small habitat.

Y2 **Observe and describe how seeds and bulbs grow into mature plants.**

Skill

Core knowledge

- A seed is a small object made by a plant that can grow into a new plant.
- Seeds need water and warmth to start growing (germinate).
- As the plant grows bigger, it develops leaves and flowers.
- The flowers of plants produce seeds.
- The flowers on some plants develop into fruit that contains seeds.
- Seeds also form inside cones.

Broad knowledge

Plants grow from seeds and bulbs. Seeds and bulbs need water and warmth to start growing (germinate). As the plant grows bigger, it develops leaves and flowers.

Hinterland

The flowers of plants produce seeds. Seeds also form inside cones. The flowers on some plants develop into fruit that contains seeds.

Y2 **Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.**

Skill

Core knowledge

- Plants need water, light and a suitable temperature to grow and stay healthy.

Broad knowledge

Plants need water, light and a suitable temperature to grow and stay healthy. Without any one of these things, they will die.

Animal Survival

Hide

10 Programmes of study, 10 skills and 18 knowledge statements

Year 2 | Driver subject | Science | Gather & record data | Habitats | Identify & classify | Nutrition | Pattern seeking | Properties and uses | Questioning | Report and conclude | Survival

Y2 **Ask simple questions and recognise that they can be answered in different ways.**

Skill

Broad knowledge

Questions can help us find out about the world.

Hinterland

The life cycle stages of a darkling beetle include egg, mealworm (larva), pupa and adult darkling beetle. The life cycle stages of a butterfly include egg, caterpillar (larva), pupa and adult butterfly. Mealworms and caterpillars undergo metamorphosis, completely changing from larva to their adult form.

Y2 **Use their observations and ideas to suggest answers to questions.**

Skill

Core knowledge

- Results from an investigation can be used to answer a question.

Broad knowledge

The results are information that has been found out from an investigation and can be used to answer a question.

Y2 **Gather and record data to help in answering questions.**

Skill

Core knowledge

- A timeline is a linear diagram.
- A life cycle is a circular diagram.

Broad knowledge

Data can be recorded and displayed in different ways, including tables, charts, pictograms and drawings.

Y2 **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.**

Skill

Core knowledge

- Humans can damage or destroy habitats. Their actions can harm and even kill living things.
- Humans can help habitats. They can create new habitats, make habitats safer or provide food and shelter for living things.

Core knowledge

- A habitat is a place where plants and animals live.
- Local habitats include parks, woodland and gardens. Habitats beyond the locality include beaches, rainforests, deserts, oceans and mountains.
- A habitat provides food, water, shelter and space.

Broad knowledge

Local habitats include parks, woodland and gardens. Habitats beyond the locality include beaches, rainforests, deserts, oceans and mountains. All living things live in a habitat to which they are suited and it must provide everything they need to survive.

Hinterland

Habitats have non-living parts, such as air, water, soil and temperature, and living parts, including plants and animals. Each habitat varies in its living and non-living parts, and they are interdependent.

Y2 **Identify and name a variety of plants and animals in their habitats, including microhabitats.**

Skill

Core knowledge 3

- A habitat is a place where plants and animals live.
- A microhabitat is a very small habitat.

Broad knowledge

A habitat is a place where a living thing lives. A microhabitat is a very small habitat.

Hinterland

Microhabitats are small habitats within a larger habitat. Examples of microhabitats are rock pools, ponds, hedgerows and under logs and stones. Microhabitats have different living and non-living parts compared with the larger habitat.

Hinterland

Invertebrates are animals without a backbone. Invertebrates include worms, molluscs, crustaceans, insects, arachnids and myriapods.

Y2 **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.**

Skill

Core knowledge

- Food chains show how living things depend on one another for food. Plants always start a food chain because they are producers that make their own food using sunlight.

Broad knowledge

Food chains show how living things depend on one another for food. All food chains start with a plant, followed by animals that either eat the plant or other animals.

Y2 **Notice that animals, including humans, have offspring which grow into adults.**

Skill

Core knowledge 2

- Animals are born or hatch from eggs. The young grow and change until they become adults that can reproduce.
- A life cycle can be drawn as a circular diagram.

Broad knowledge

Animals have offspring that grow into adults. Different animals have different stages of growth or life cycles.

Hinterland

All living things need space to grow and reproduce. Adult animals reproduce to have offspring. Some offspring look like smaller versions of their parents. Others look very different from their parents. The offspring of birds, reptiles, fish, amphibians and invertebrates hatch from eggs. Mammals, including humans, give birth to live young.

Hinterland

All animals have a life cycle, which is a series of changes that happens to a living thing during its life. Animals are born or hatch from eggs. The young grow and change until they become adults that can reproduce. When adult animals reproduce and have offspring, the life cycle starts again.

Hinterland

A life cycle can be drawn as a circular diagram.

Y2 **Find out about and describe the basic needs of animals, including humans, for survival (water, food and air).**

Skill

Core knowledge

- An animal's habitat must provide water, food, air and shelter for the animal to survive.
- Animals eat food that is found in their habitat. Herbivores eat plants. Omnivores eat plants and animals (meat). Carnivores eat other animals (meat).

Broad knowledge

Animals need water, food, air and shelter to survive. Their habitat must provide all these things.

Hinterland

Many animals behave differently in different seasons in the United Kingdom. These different behaviours are linked to their life cycles, with spring often being the time for new offspring.

Y2 **Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.**

Skill

Core knowledge

- A material's physical properties make it suitable for particular purposes, such as glass for windows and brick for building walls.
- Objects can be made from one material, more than one material or different materials with similar properties.

Broad knowledge

A material's physical properties make it suitable for particular purposes, such as glass for windows and brick for building walls. Many materials are used for more than one purpose, such as metal for cutlery and cars.

Y2 **Develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics.**

Skill

Core knowledge

- The UK has typical weather in each of the seasons. For example, winter is cold and sometimes frosty, whereas summer is warm and sometimes sunny.
- Many animals behave differently in different seasons in the UK. These different behaviours, such as migration and hibernation, are linked to their life cycles, with spring often being the time for new offspring.

Broad knowledge

The UK has typical weather in each of the seasons. For example, winter is cold and sometimes frosty, whereas summer is warm and sometimes sunny.

Push and Pull

1 Programme of study, 1 skills and 1 knowledge statement

Year 2 | Driver subject | Design and technology | Modelling

Y2 **Develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics.**

Skill

Broad knowledge

Models can have moving parts that use levers, sliders, wheels and axles.

Animal Nutrition and the Skeletal System

Hide

13 Programmes of study, 15 skills and 19 knowledge statements

Year 3 | Driver subject | Science | Gather & record data | Healthy lifestyle | Human body | Identify & classify | Investigation | Nutrition | Observation | Parts and functions | Questioning | Report and conclude | Survival

Y3 **Ask relevant questions and using different types of scientific enquiries to answer them.**

Skill

Core knowledge

- Questions can help us find out about the world and can be answered in different ways.

Broad knowledge

Questions can help us find out about the world and can be answered in different ways.

Y3 **Set up simple practical enquiries, comparative and fair tests.**

Skill

Core knowledge

- A prediction is a best guess for what might happen in an investigation based on some prior knowledge.

Broad knowledge

Tests can be set up and carried out by following or planning a set of instructions. A prediction is a best guess for what might happen in an investigation based on some prior knowledge.

Hinterland

A joint is a place where two or more bones meet and connect. The human skeleton, and the skeletons of other animals, have many bones connected by joints to easily move and bend parts of the body in different directions. Parts of a joint include cartilage, synovial fluid and ligaments. Three types of joints found in the human skeleton are the hinge joint, ball and socket joint and pivot joint.

Y3 **Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.**

Skill

Broad knowledge

An observation involves looking closely at objects, materials and living things, which can be compared and grouped according to their features.

Y3 **Gather, record, classify and present data in a variety of ways to help in answering questions.**

Skill

Core knowledge

- Data can be used to provide evidence to answer questions.

Broad knowledge

Data can be recorded and displayed in different ways, including tables, charts, graphs and labelled diagrams. Data can be used to provide evidence to answer questions.

Hinterland

Plants and animals are living things. Plants have different parts to help them survive and reproduce, including roots, stems, flowers, fruit and leaves. Plants need sunlight, warmth, nutrients, water, air and space to grow and be healthy. There are six main animal groups: amphibians, birds, fish, invertebrates, mammals and reptiles. Animals can be carnivores that eat meat, herbivores that eat plant parts or omnivores that eat meat and plant parts. All animals, including humans, need food, water, air, shelter, sleep and space to reproduce and survive. Animals, including humans, have different body parts with different functions. Some body parts, such as eyes and ears, help animals to sense their surroundings.

Y3 **Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.**

Skill

Core knowledge

- Data can be used to provide evidence to answer questions.

Broad knowledge

Data can be recorded and displayed in different ways, including tables, charts, graphs and labelled diagrams. Data can be used to provide evidence to answer questions.

Hinterland

Plants and animals are living things. Plants have different parts to help them survive and reproduce, including roots, stems, flowers, fruit and leaves. Plants need sunlight, warmth, nutrients, water, air and space to grow and be healthy. There are six main animal groups: amphibians, birds, fish, invertebrates, mammals and reptiles. Animals can be carnivores that eat meat, herbivores that eat plant parts or omnivores that eat meat and plant parts. All animals, including humans, need food, water, air, shelter, sleep and space to reproduce and survive. Animals, including humans, have different body parts with different functions. Some body parts, such as eyes and ears, help animals to sense their surroundings.

Y3 **Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.**

Skill

Broad knowledge

Results are information that has been discovered as part of an investigation. A conclusion is the answer to a question that uses the evidence collected.

Y3 **Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.**

Skill

Broad knowledge

Results are information that has been discovered as part of an investigation. A conclusion is the answer to a question that uses the evidence collected.

Y3 **Identify differences, similarities or changes related to simple scientific ideas and processes.**

Skill

Broad knowledge

An observation involves looking closely at objects, materials and living things, which can be compared and grouped according to their features.

Y3 **Use straightforward scientific evidence to answer questions or to support their findings.**

Skill

Broad knowledge

Results are information that has been discovered as part of an investigation. A conclusion is the answer to a question that uses the evidence collected.

Y3 **Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.**

Skill

Core knowledge

- Many plants grow from seeds or bulbs.
- Plants have roots, stems, leaves, flowers and fruit.

Broad knowledge

The plant's roots anchor the plant in the ground and transport water and minerals from the ground to the plant. The stem (or trunk) support the plant above the ground. The leaves collect energy from the Sun and make food for the plant. Flowers make seeds to produce new plants.

Y3 **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.**

Skill

Core knowledge

- Plants are living things because they grow, take in water and nutrients and reproduce.

Broad knowledge

Plants need air, light, water, minerals from the soil and room to grow, in order to survive. Different plants have different needs depending on their habitat. Examples include cacti, which need less water than is typical, and ferns, which can grow in lower light levels.

Y3 **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.**

Skill

Core knowledge

- Carnivores only eat meat.
- Herbivores only eat plants.
- Omnivores eat meat and plants.

Core knowledge

- Nutrition is the life process of making or finding food to eat.
- Humans must eat food and drink water to gain the nutrients they need to survive.
- Humans are omnivores, so they can eat both plant parts and animals.

Core knowledge

- In the wild, animals' diets change over the year as the seasons change due to certain foods becoming available or unavailable.

Broad knowledge

Animals cannot make their own food and need to get nutrition from the food they eat. Carnivores get their nutrition from eating other animals. Herbivores get their nutrition from plants. Omnivores get their nutrition from eating a combination of both plants and other animals.

Hinterland

Nutrition is the life process of making or finding food to eat. Nutrition allows plants and animals to grow, stay healthy, and survive. Humans are omnivores. The fossils of ancient humans' teeth show that humans have always been omnivores. Today, some humans choose not to eat an omnivorous diet but follow a vegetarian or vegan diet. Humans can suffer from malnutrition, meaning poor nutrition, if they do not eat the right amounts and the right types of food. Malnutrition can cause health problems.

Hinterland

In the UK, wild animals' diets change during the year. What they eat depends on the season because certain foods become available and unavailable in different seasons. Usually, food becomes available in the spring and abundant in summer, when many animals eat a lot to prepare for the lack of food in autumn and winter. Animals can hibernate, use their fat reserves, store and hide food, or migrate to warmer climates to find food to survive winter.

Skill

Core knowledge

- Humans get nutrition from what they eat.

- It is important to have a balanced diet made up of the main food groups, including: proteins, carbohydrates, fruit and vegetables, dairy products and alternatives, and fats and spreads.
- Humans stay hydrated by drinking water.

Broad knowledge

Humans have to get nutrition from what they eat. It is important to have a balanced diet made up of the main food groups, including proteins, carbohydrates, fruit and vegetables, dairy products and alternatives, and fats and spreads. Humans need to stay hydrated by drinking water.

Hinterland

Food provides the human body with energy and nutrients, including vitamins and minerals, which it needs to grow and stay healthy. A balanced diet contains the right proportions of foods from different food groups. The Eatwell guide is a diagram showing the balance of foods humans should eat from the five main food groups. Fruit and vegetables help the body fight diseases and keep the digestive system healthy. Carbohydrates are the body's main source of energy. Protein helps the human body to grow, repair and build muscle. Dairy and alternatives contain nutrients and the mineral calcium, which is important for healthy bones and teeth. Oils and spreads contain fat which helps humans absorb certain vitamins. Foods high in sugar, salt or fat are not needed for a balanced diet and eating too many can cause health problems.

Y3 **Identify that humans and some other animals have skeletons and muscles for support, protection and movement.**

Skill

Core knowledge

- A joint is where two or more bones meet and connect.
- Parts of the human body can bend easily because the skeleton has lots of small bones and joints.

Core knowledge

- Humans have a skeleton and muscles for movement, support and protecting organs.

Core knowledge

- Muscles are soft tissue made up of many stretchy fibres.
- Muscles allow us to move, breathe and digest food.
- The three main types of muscle in the human body are skeletal, cardiac and smooth.

Broad knowledge

Humans have a skeleton and muscles for movement, support and protecting organs. Major bones in the human body include the skull, ribs, spine, humerus, ulna, radius, pelvis, femur, tibia and fibula. Major muscle groups in the human body include the biceps, triceps, abdominals, trapezius, gluteals, hamstrings, quadriceps, deltoids, gastrocnemius, latissimus dorsi and pectorals.

Hinterland

A skeleton is a frame of bones that supports the body and gives it shape. Most vertebrates have a similar skeleton with many of the same bones. However, the position and size of the bones vary in each skeleton.

Hinterland

Muscles are soft tissues made up of many stretchy fibres. They allow humans to move, breathe and digest food. There are three main types of muscle in the human body: smooth muscle, skeletal muscle and cardiac muscle. Smooth muscles are in organs. Skeletal muscles are attached to the skeleton, working in pairs to pull bones, making them move. Cardiac muscles are in the heart.

Skill

Core knowledge

- Vertebrates are animals with a spine.
- Invertebrates are animals without a spine.
- All vertebrates have an endoskeleton meaning their skeleton is found inside their body.
- Invertebrates have an exoskeleton or no skeleton.

Broad knowledge

Some animals have skeletons for support, movement and protection. Endoskeletons are those found inside some animals, such as humans, cats and horses. Exoskeletons are those found on the outside of some animals, such as beetles and flies. Some animals have no skeleton, such as slugs and jellyfish.

Hinterland

Vertebrates are animals with a spine. Invertebrates are animals without a spine. All vertebrates have an endoskeleton meaning their skeleton is found inside their body. Invertebrates have an exoskeleton or no skeleton. An exoskeleton, which means 'outside skeleton', is a hard outer layer that covers the outside of most invertebrates' bodies and protects their soft body parts inside.

Cook Well, Eatwell

Hide

1 Programme of study, 1 skills and 1 knowledge statement

Year 3 | Driver subject | Design and technology | Healthy lifestyle

Y3 **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.**

Skill

Core knowledge

- Humans get nutrition from what they eat.

- It is important to have a balanced diet made up of the main food groups, including: proteins, carbohydrates, fruit and vegetables, dairy products and alternatives, and fats and spreads.
- Humans stay hydrated by drinking water.

Broad knowledge

Humans have to get nutrition from what they eat. It is important to have a balanced diet made up of the main food groups, including proteins, carbohydrates, fruit and vegetables, dairy products and alternatives, and fats and spreads. Humans need to stay hydrated by drinking water.

Rocks, Relics and Rumbles

Hide

3 Programmes of study, 3 skills and 3 knowledge statements

Year 3 | Driver subject | Geography | Changes | Earth | Properties and uses

Y3 **Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.**

Skill

Core knowledge

- Sedimentary, igneous and metamorphic are the three different rock types.
- Sedimentary rocks form from mud, sand and particles that have been squashed together over a long time to form rock.
- Igneous rocks are made from cooled magma or lava.
- Metamorphic rocks are formed when existing rocks are heated by the magma under the Earth's crust or squashed by the movement of the Earth's tectonic plates.

Broad knowledge

There are three different rock types: sedimentary, igneous and metamorphic. Sedimentary rocks form from mud, sand and particles that have been squashed together over a long time to form rock. Examples include sandstone and limestone. Igneous rocks are made from cooled magma or lava. They usually contain visible crystals. Examples include pumice and granite. Metamorphic rocks are formed when existing rocks are heated by the magma under the Earth's crust or squashed by the movement of the Earth's tectonic plates. They are usually very hard. Examples include slate and marble.

Y3 **Describe in simple terms how fossils are formed when things that have lived are trapped within rock.**

Skill

Core knowledge

- Fossils form over millions of years and are the remains of a once-living organism, preserved as rock.
- Scientists can use fossils to find out what life on Earth was like in prehistoric times.

Broad knowledge

Fossils form over millions of years and are the remains of a once-living organism, preserved as rock. Scientists can use fossils to find out what life on Earth was like in prehistoric times. Fossils form when a living thing dies in a watery environment. The body gets covered by mud and sand and the soft tissues rot away. Over time, the ground hardens to form sedimentary rock and the skeletal or shell remains turn to rock.

Y3 **Recognise that soils are made from rocks and organic matter.**

Skill

Core knowledge

- Soils are made from tiny pieces of eroded rock, air and organic matter.
- Soil is one of the world's most important natural resources supporting a wide range of food chains. Soil holds water and nutrients and provides anchorage for roots.

Broad knowledge

Soils are made from tiny pieces of eroded rock, air and organic matter. There are a variety of naturally occurring soils, including clay, sand and silt. Different areas have different soil types.

Forces and Magnets

Hide

15 Programmes of study, 16 skills and 20 knowledge statements

Year 3 | Driver subject | Science | Forces | Gather & record data | Investigation | Measurement | Observation | Phenomena | Physical things | Properties and uses | Questioning | Report and conclude

Y3 **Ask relevant questions and using different types of scientific enquiries to answer them.**

Skill

Core knowledge

- Questions can help us find out about the world and can be answered in different ways.

Broad knowledge

Questions can help us find out about the world and can be answered in different ways.

Y3 **Set up simple practical enquiries, comparative and fair tests.**

Skill

Broad knowledge

Tests can be set up and carried out by following or planning a set of instructions. A prediction is a best guess for what might happen in an investigation based on some prior knowledge.

Y3 **Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.**

Skill

Broad knowledge

Equipment is used to take measurements in standard units. Examples include data loggers plus sensors, timers (seconds, minutes and hours), thermometers (°C) and metre sticks (millimetres, centimetres and metres). Taking repeat readings can increase the accuracy of the measurement.

Hinterland

A force meter is a piece of equipment that measures a force or mass. Forces are measured in newtons (N). Mass is measured in kilograms (kg).

Skill

Broad knowledge

An observation involves looking closely at objects, materials and living things, which can be compared and grouped according to their features.

Hinterland

Magnets have invisible magnetic fields that can be seen using iron filings. Magnetic field lines emerge from a magnet's north pole then travel in an arc to a magnet's south pole. Magnetic force is stronger at the poles of a magnet.

Y3 **Gather, record, classify and present data in a variety of ways to help in answering questions.**

Skill

Core knowledge

- Data can be used to provide evidence to answer questions.

Broad knowledge

Data can be recorded and displayed in different ways, including tables, charts, graphs and labelled diagrams. Data can be used to provide evidence to answer questions.

Hinterland

A bar chart displays information (data) as rectangular bars. A bar chart's vertical axis has a numerical scale, and its horizontal axis has values of something that has been investigated.

Y3 **Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.**

Skill

Core knowledge

- Data can be used to provide evidence to answer questions.

Broad knowledge

Data can be recorded and displayed in different ways, including tables, charts, graphs and labelled diagrams. Data can be used to provide evidence to answer questions.

Hinterland

A bar chart displays information (data) as rectangular bars. A bar chart's vertical axis has a numerical scale, and its horizontal axis has values of something that has been investigated.

Y3 **Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.**

Skill

Broad knowledge

Results are information that has been discovered as part of an investigation. A conclusion is the answer to a question that uses the evidence collected.

Hinterland

The Earth acts like a huge bar magnet. It is surrounded by an invisible magnetic field called the magnetosphere, protecting it from the Sun's solar wind.

Hinterland

A navigational compass needle is magnetic and always points north.

Y3 **Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.**

Skill

Broad knowledge

Results are information that has been discovered as part of an investigation. A conclusion is the answer to a question that uses the evidence collected.

Hinterland

The Earth acts like a huge bar magnet. It is surrounded by an invisible magnetic field called the magnetosphere, protecting it from the Sun's solar wind.

Hinterland

A navigational compass needle is magnetic and always points north.

Y3 **Identify differences, similarities or changes related to simple scientific ideas and processes.**

Skill

Broad knowledge

An observation involves looking closely at objects, materials and living things, which can be compared and grouped according to their features.

Hinterland

Magnets have invisible magnetic fields that can be seen using iron filings. Magnetic field lines emerge from a magnet's north pole then travel in an arc to a magnet's south pole. Magnetic force is stronger at the poles of a magnet.

Y3 **Use straightforward scientific evidence to answer questions or to support their findings.**

Skill

Broad knowledge

Results are information that has been discovered as part of an investigation. A conclusion is the answer to a question that uses the evidence collected.

Hinterland

The Earth acts like a huge bar magnet. It is surrounded by an invisible magnetic field called the magnetosphere, protecting it from the Sun's solar wind.

Hinterland

A navigational compass needle is magnetic and always points north.

Y3 **Compare how things move on different surfaces.**

Skill

Core knowledge

- Friction is a force between two surfaces as they move over each other.
- Smooth surfaces usually generate less friction than rough surfaces.
- Friction slows down a moving object.

Broad knowledge

Friction is a force between two surfaces as they move over each other. Friction slows down a moving object. Smooth surfaces usually generate less friction than rough surfaces.

Hinterland

Friction is greater the rougher the surfaces.

Y3 **Notice that some forces need contact between two objects, but magnetic forces can act at a distance.**

Skill

Core knowledge

- Some push and pull forces require direct contact.

Core knowledge

- Forces cause objects to move, change speed or change shape.

Broad knowledge

An object will not move unless a pushing or pulling force is applied. Some forces require direct contact, whereas other forces can act at a distance, such as magnetic force.

Hinterland

Forces act in pairs that oppose each other. Forces cause objects to move, change speed or change shape.

Y3 **Observe how magnets attract or repel each other and attract some materials and not others.**

Skill

Core knowledge

- Magnetic materials are attracted to magnets.
- Iron, cobalt, nickel and steel are magnetic metals. Other metals and materials such as plastic, paper, glass and wood are not magnetic.

Broad knowledge

Some materials have magnetic properties. Magnetic materials are attracted to magnets. All magnetic materials are metals but not all metals are magnetic. Iron is a magnetic metal.

Hinterland

Iron, cobalt, nickel and steel are magnetic metals.

Y3 **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.**

Skill

Core knowledge

- Magnetic materials are attracted to magnets.
- Iron, cobalt, nickel and steel are magnetic metals. Other metals and materials such as plastic, paper, glass and wood are not magnetic.

Broad knowledge

Some materials have magnetic properties. Magnetic materials are attracted to magnets. All magnetic materials are metals but not all metals are magnetic. Iron is a magnetic metal.

Hinterland

Iron, cobalt, nickel and steel are magnetic metals.

Y3 **Describe magnets as having two poles.**

Skill

Core knowledge 2

- There are different types of magnets including bar magnets, horseshoe magnets and floating magnets.
- Magnets have different strengths.

Core knowledge

- Magnetism is a non-contact force.
- Magnets have two poles (north and south). Opposite poles (north and south) attract each other.
- Like poles (north and north, or south and south) repel each other.

Broad knowledge

Magnets have two poles (north and south). Opposite poles (north and south) attract each other, while like poles (north and north, or south and south) repel each other.

Hinterland

Magnetism is a non-contact force.

Hinterland

There are different types of magnets, such as horseshoe magnets, magnetic marbles, wand magnets and floating magnets. Magnets have different strengths.

Y3 **Predict whether two magnets will attract or repel each other, depending on which poles are facing.**

Skill

Core knowledge 2

- There are different types of magnets including bar magnets, horseshoe magnets and floating magnets.
- Magnets have different strengths.

Core knowledge

- Magnetism is a non-contact force.
- Magnets have two poles (north and south). Opposite poles (north and south) attract each other.
- Like poles (north and north, or south and south) repel each other.

Broad knowledge

Magnets have two poles (north and south). Opposite poles (north and south) attract each other, while like poles (north and north, or south and south) repel each other.

Hinterland

Magnetism is a non-contact force.

Hinterland

There are different types of magnets, such as horseshoe magnets, magnetic marbles, wand magnets and floating magnets. Magnets have different strengths.

Making It Move

1 Programme of study, 1 skills

Year 3 | Driver subject | Design and technology | Modelling

Y3 **Are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.**

Skill

Plant Nutrition and Reproduction

Hide

13 Programmes of study, 14 skills and 18 knowledge statements

Year 3 | Driver subject | Science | Gather & record data | Investigation | Living things | Measurement | Observation | Parts and functions | Questioning | Report and conclude | Survival

Y3 **Ask relevant questions and using different types of scientific enquiries to answer them.**

Skill

Core knowledge

- Questions can help us find out about the world and can be answered in different ways.

Broad knowledge

Questions can help us find out about the world and can be answered in different ways.

Hinterland

Pollination is the process where pollen grains are transferred from the stamen of one flower to the carpel of another of the same type. After pollination, seeds form in the carpel's ovary. A pollinator is an animal that pollinates flowering plants. Some plants are pollinated by the wind.

Y3 **Set up simple practical enquiries, comparative and fair tests.**

Skill

Core knowledge

- A prediction is a best guess for what might happen in an investigation based on some prior knowledge.

Broad knowledge

Tests can be set up and carried out by following or planning a set of instructions. A prediction is a best guess for what might happen in an investigation based on some prior knowledge.

Y3 **Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.**

Skill

Broad knowledge

Equipment is used to take measurements in standard units. Examples include data loggers plus sensors, timers (seconds, minutes and hours), thermometers (°C) and metre sticks (millimetres, centimetres and metres). Taking repeat readings can increase the accuracy of the measurement.

Hinterland

Leaves have two main functions. They capture energy from sunlight to make food through the process of photosynthesis, and they lose water in a process called transpiration, which causes water and nutrients to enter the root and move through the plant. The structure, shape, size and position of leaves help them carry out these functions.

Skill

Broad knowledge

An observation involves looking closely at objects, materials and living things, which can be compared and grouped according to their features.

Hinterland

The parts of a flower include the sepal, petal, stamen and carpel. The male stamen includes the anther and the filament. The female carpel consists of the stigma, style and ovary.

Y3 **Gather, record, classify and present data in a variety of ways to help in answering questions.**

Skill

Core knowledge

- Data can be used to provide evidence to answer questions.

Broad knowledge

Data can be recorded and displayed in different ways, including tables, charts, graphs and labelled diagrams. Data can be used to provide evidence to answer questions.

Y3 **Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.**

Skill

Core knowledge

- Data can be used to provide evidence to answer questions.

Broad knowledge

Data can be recorded and displayed in different ways, including tables, charts, graphs and labelled diagrams. Data can be used to provide evidence to answer questions.

Y3 **Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.**

Skill

Broad knowledge

Results are information that has been discovered as part of an investigation. A conclusion is the answer to a question that uses the evidence collected.

Y3 **Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.**

Skill

Broad knowledge

Results are information that has been discovered as part of an investigation. A conclusion is the answer to a question that uses the evidence collected.

Y3 **Identify differences, similarities or changes related to simple scientific ideas and processes.**

Skill

Broad knowledge

An observation involves looking closely at objects, materials and living things, which can be compared and grouped according to their features.

Hinterland

The parts of a flower include the sepal, petal, stamen and carpel. The male stamen includes the anther and the filament. The female carpel consists of the stigma, style and ovary.

Y3 **Use straightforward scientific evidence to answer questions or to support their findings.**

Skill

Broad knowledge

Results are information that has been discovered as part of an investigation. A conclusion is the answer to a question that uses the evidence collected.

Y3 **Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.**

Skill

Core knowledge

- Parts of a flower include the sepal, petal, stamen and carpel.

Core knowledge

- Roots anchor the plant in the ground and transport water and minerals from the ground to the plant.
- The stem (or trunk) support the plant above the ground.
- Leaves collect energy from the Sun and make food for the plant.
- Flowers make seeds to produce new plants.

Broad knowledge

The plant's roots anchor the plant in the ground and transport water and minerals from the ground to the plant. The stem (or trunk) support the plant above the ground. The leaves collect energy from the Sun and make food for the plant. Flowers make seeds to produce new plants.

Hinterland

Plant parts have specific functions. The stem transports water, nutrients and food around the plant. The leaves draw water and nutrients from the soil up through the roots and the stem of the plant. Seeds are dispersed away from the parent plant.

Y3 **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.**

Skill

Core knowledge

- Plants need air, light, water, nutrients and room to grow, in order to survive.

Broad knowledge

Plants need air, light, water, minerals from the soil and room to grow, in order to survive. Different plants have different needs depending on their habitat. Examples include cacti, which need less water than is typical, and ferns, which can grow in lower light levels.

Y3 **Investigate the way in which water is transported within plants.**

Skill

Core knowledge 2

- Water is transported in plants from the roots, through the stem to the leaves.

Broad knowledge

Water is transported in plants from the roots, through the stem and to the leaves, through tiny tubes called xylem.

Hinterland

There are two main types of root systems. In a taproot system, a primary root grows deep into the soil. Lateral roots covered in tiny root hairs grow out from the sides of the taproot and take in water and nutrients from the soil. A fibrous root system grows just under the soil's surface from the plant's stem. Fibrous roots are covered in root hairs and spread far from the plant to take in water and nutrients. Aerial roots are unusual because they grow above ground.

Hinterland

Vascular plants contain tubes called vessels. Xylem carry water and nutrients. Phloem carry food made by the plant's leaves to where it is needed.

Y3 **Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.**

Skill

Core knowledge

- Pollination is the process where pollen is transferred from the male stamen to the female carpel of another flower of the same type.

Core knowledge

- The stages of a plant's life cycle include: germination, flower production, pollination, fertilisation, seed formation and seed dispersal.

Core knowledge

- Seeds can be dispersed by wind, animals, explosion and water.

Broad knowledge

Flowers are important in the life cycle of flowering plants. The processes of a plant's life cycle include germination, flower production, pollination, seed formation and seed dispersal. Insects and the wind can transfer pollen from one plant to another (pollination). Animals, wind, water and explosions can disperse seeds away from the parent plant (seed dispersal).

Hinterland

A life cycle is a series of changes that happen to a living thing during its lifetime. All plants have a life cycle.

Hinterland

Seed dispersal is the movement of seeds away from the parent plant.

Light and Shadows

Hide

14 Programmes of study, 15 skills and 17 knowledge statements

Year 3 | Driver subject | Science | Gather & record data | Identify & classify | Investigation | Measurement | Observation | Pattern seeking | Phenomena | Questioning | Report and conclude | Staying safe

Y3 **Ask relevant questions and using different types of scientific enquiries to answer them.**

Skill

Core knowledge

- Questions can help us find out about the world and can be answered in different ways.

Broad knowledge

Questions can help us find out about the world and can be answered in different ways.

Y3 **Set up simple practical enquiries, comparative and fair tests.**

Skill

Broad knowledge

Tests can be set up and carried out by following or planning a set of instructions. A prediction is a best guess for what might happen in an investigation based on some prior knowledge.

Y3 **Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.**

Skill

Broad knowledge

Equipment is used to take measurements in standard units. Examples include data loggers plus sensors, timers (seconds, minutes and hours), thermometers (°C) and metre sticks (millimetres, centimetres and metres). Taking repeat readings can increase the accuracy of the measurement.

Skill

Broad knowledge

An observation involves looking closely at objects, materials and living things, which can be compared and grouped according to their features.

Hinterland

A shadow is made when an object blocks the passage of light from a light source. A shadow is the same shape as the object that casts it because light travels in straight lines. Shadows always appear on the opposite side of the light source.

Y3 **Gather, record, classify and present data in a variety of ways to help in answering questions.**

Skill

Core knowledge

- Data can be used to provide evidence to answer questions.

Broad knowledge

Data can be recorded and displayed in different ways, including tables, charts, graphs and labelled diagrams. Data can be used to provide evidence to answer questions.

Hinterland

A light source produces light. A reflector reflects light. Light sources and reflectors can be natural, such as the Sun and Moon, or artificial, such as a light bulb or bike reflector.

Y3 **Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.**

Skill

Core knowledge

- Data can be used to provide evidence to answer questions.

Broad knowledge

Data can be recorded and displayed in different ways, including tables, charts, graphs and labelled diagrams. Data can be used to provide evidence to answer questions.

Hinterland

A light source produces light. A reflector reflects light. Light sources and reflectors can be natural, such as the Sun and Moon, or artificial, such as a light bulb or bike reflector.

Y3 **Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.**

Skill

Broad knowledge

Results are information that has been discovered as part of an investigation. A conclusion is the answer to a question that uses the evidence collected.

Y3 **Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.**

Skill

Broad knowledge

Results are information that has been discovered as part of an investigation. A conclusion is the answer to a question that uses the evidence collected.

Y3 **Identify differences, similarities or changes related to simple scientific ideas and processes.**

Skill

Broad knowledge

An observation involves looking closely at objects, materials and living things, which can be compared and grouped according to their features.

Hinterland

A shadow is made when an object blocks the passage of light from a light source. A shadow is the same shape as the object that casts it because light travels in straight lines. Shadows always appear on the opposite side of the light source.

Y3 **Use straightforward scientific evidence to answer questions or to support their findings.**

Skill

Broad knowledge

Results are information that has been discovered as part of an investigation. A conclusion is the answer to a question that uses the evidence collected.

Y3 **Recognise that they need light in order to see things and that dark is the absence of light.**

Skill

Core knowledge

- A light source is something that produces light.
- A reflector is something that reflects light.

Core knowledge

- Light is a form of energy that travels in straight lines from a light source.
- Dark is the absence of light and we need light to be able to see.
- The main natural light source on Earth is the Sun.

Broad knowledge

Dark is the absence of light and we need light to be able to see.

Hinterland

Light is a form of energy that travels in straight lines.

Y3 **Notice that light is reflected from surfaces.**

Skill

Core knowledge

- Light can be reflected from different surfaces.
- Reflective materials are light in colour, shiny and smooth.
- Less reflective and non-reflective materials are dark in colour, dull and rough.

Broad knowledge

Light can be reflected from different surfaces. Some surfaces are poor reflectors, such as some fabrics, while other surfaces are good reflectors, such as mirrors.

Hinterland

Reflective materials are light in colour, shiny and smooth. Non-reflective materials are dark in colour, dull and rough.

Y3 **Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.**

Skill

Core knowledge

- Light from the Sun is damaging for vision and the skin.
- People can protect themselves from the Sun by using sun cream, wearing sun hats and sunglasses and by staying indoors or in the shade.

Broad knowledge

Light from the Sun is damaging for vision and the skin. Protection from the Sun includes sun cream, sun hats, sunglasses and staying indoors or in the shade.

Y3 **Recognise that shadows are formed when the light from a light source is blocked by a solid object.**

Skill

Core knowledge

- A shadow is an area of darkness made when an object blocks light.

Core knowledge

- Opaque objects cast dark shadows.
- Translucent objects cast lighter, blurry shadows.
- Transparent objects allow light to pass through them and do not create shadows.

Core knowledge

- Shadows change when the light source or the object moves. The lower the light source the longer the shadow.

Broad knowledge

A shadow is formed when light from a light source, such as the Sun, is blocked by an object. Opaque objects cast dark shadows. Translucent objects cast pale shadows. Transparent objects cast very pale shadows.

Hinterland

Opaque objects cast dark shadows. Translucent objects cast lighter, blurry shadows.

Hinterland

Shadows change when the light source or the object moves. For example, when a light source is lowered, shadows grow longer.

Y3 **Find patterns in the way that the size of shadows change.**

Skill

Core knowledge

- Shadows change shape and size when the light source moves.
- The higher the light source the shorter the shadow.
- The lower the light source the longer the shadow.

Broad knowledge

Shadows change shape and size when the light source moves. For example, when the light source is high above the object, the shadow is short and when the light source is low down, the object's shadow is long.

Food and the Digestive System

Hide

14 Programmes of study, 15 skills and 17 knowledge statements

Year 4 | Driver subject | Science | Gather & record data | Healthy lifestyle | Human body | Investigation | Living things | Measurement | Nutrition | Observation | Parts and functions | Questioning | Report and conclude

Y4 **Ask relevant questions and using different types of scientific enquiries to answer them.**

Skill

Core knowledge

- Questions can help us find out about the world and can be answered using scientific enquiry.

Broad knowledge

Questions can help us find out about the world and can be answered using scientific enquiry.

Hinterland

The parts of a healthy tooth include the crown and root, which include dentine, enamel, pulp and the root canal. Plaque is a film of bacteria that coats the teeth and causes tooth decay. Sugary foods and drinks can cause tooth decay. Fluoride, a chemical added to toothpaste, helps to prevent tooth decay. A dental cavity is a hole in a tooth's enamel caused by tooth decay. Good oral hygiene involves brushing teeth twice a day for two minutes using fluoride toothpaste, cleaning between teeth with an interdental brush or floss and visiting a dentist at least once a year.

Y4 **Set up simple practical enquiries, comparative and fair tests.**

Skill

Core knowledge

- Scientific enquiries can be set up and carried out by following or planning a method.
- A prediction is a statement about what might happen in an investigation, based on some prior knowledge or understanding.
- A fair test is one in which only one variable is changed and all others remain constant.

Broad knowledge

Scientific enquiries can be set up and carried out by following or planning a method. A prediction is a statement about what might happen in an investigation, based on some prior knowledge or understanding. A fair test is one in which only one variable is changed and all others remain constant.

Y4 **Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.**

Skill

Broad knowledge

Equipment is used to take measurements in standard units. Examples include data loggers plus sensors, timers (seconds, minutes and hours), thermometers (°C), and metre sticks, rulers or trundle wheels (millimetres, centimetres, metres).

Skill

Core knowledge

- Observations can be made regularly to identify changes over time.

Broad knowledge

An observation involves looking closely at objects, materials and living things. Observations can be made regularly to identify changes over time.

Y4 **Gather, record, classify and present data in a variety of ways to help in answering questions.**

Skill

Broad knowledge

Data can be recorded and displayed in different ways, including tables, charts, graphs, keys and labelled diagrams.

Hinterland

An ecosystem is a community of living organisms and their environments that interact with each other. Rainforests, deserts and oceans are examples of ecosystems. Ecosystems have biotic (living) features, including plants, animals and microorganisms, and abiotic (non-living) features, including sunlight, water, air, soil and temperature. All living things depend on their ecosystem's biotic and abiotic features for survival. This is called interdependence. Human activity, such as deforestation and natural events like wildfires and droughts, can damage ecosystems.

Y4 **Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.**

Skill

Broad knowledge

Data can be recorded and displayed in different ways, including tables, charts, graphs, keys and labelled diagrams.

Hinterland

An ecosystem is a community of living organisms and their environments that interact with each other. Rainforests, deserts and oceans are examples of ecosystems. Ecosystems have biotic (living) features, including plants, animals and microorganisms, and abiotic (non-living) features, including sunlight, water, air, soil and temperature. All living things depend on their ecosystem's biotic and abiotic features for survival. This is called interdependence. Human activity, such as deforestation and natural events like wildfires and droughts, can damage ecosystems.

Y4 **Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.**

Skill

Core knowledge

- A conclusion is the answer to a question that uses the evidence collected.

Broad knowledge

Results are information, such as data or observations, that have been found out from an investigation. A conclusion is the answer to a question that uses the evidence collected.

Hinterland

A producer is a living thing that makes its own food energy, such as a plant. A consumer is a living thing that feeds on other living things. A food chain is a diagram showing how energy from food passes from one living thing to another; it always starts with a producer, and all the other living things are consumers. A predator is a consumer that hunts, kills and eats other animals for food. An animal is called prey if a predator hunts and kills it for food.

Y4 **Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.**

Skill

Core knowledge

- A conclusion is the answer to a question that uses the evidence collected.

Broad knowledge

Results are information, such as data or observations, that have been found out from an investigation. A conclusion is the answer to a question that uses the evidence collected.

Hinterland

A producer is a living thing that makes its own food energy, such as a plant. A consumer is a living thing that feeds on other living things. A food chain is a diagram showing how energy from food passes from one living thing to another; it always starts with a producer, and all the other living things are consumers. A predator is a consumer that hunts, kills and eats other animals for food. An animal is called prey if a predator hunts and kills it for food.

Y4 **Identify differences, similarities or changes related to simple scientific ideas and processes.**

Skill

Core knowledge

- Observations can be made regularly to identify changes over time.

Broad knowledge

An observation involves looking closely at objects, materials and living things. Observations can be made regularly to identify changes over time.

Y4 **Use straightforward scientific evidence to answer questions or to support their findings.**

Skill

Core knowledge

- A conclusion is the answer to a question that uses the evidence collected.

Broad knowledge

Results are information, such as data or observations, that have been found out from an investigation. A conclusion is the answer to a question that uses the evidence collected.

Hinterland

A producer is a living thing that makes its own food energy, such as a plant. A consumer is a living thing that feeds on other living things. A food chain is a diagram showing how energy from food passes from one living thing to another; it always starts with a producer, and all the other living things are consumers. A predator is a consumer that hunts, kills and eats other animals for food. An animal is called prey if a predator hunts and kills it for food.

Y4 **Recognise that environments can change and that this can sometimes pose dangers to living things.**

Skill

Core knowledge

- Habitats change over time, either due to natural or human influences.
- All living things depend on the biotic and abiotic features of their ecosystems to survive; therefore, any change to one part will affect all the other parts.

Broad knowledge

Habitats change over time, either due to natural or human influences. Natural influences include extreme or unseasonable weather. Human influences include habitat destruction or pollution. These changes can pose a risk to animals and plants that live in the habitat.

Hinterland

All living things depend on the biotic and abiotic features of their ecosystems to survive; therefore, any change to one part will affect all the other parts. For example, if a producer, such as grass, died out in a garden ecosystem, the consumers that feed on it would starve and die unless they could find other food to eat or move to another ecosystem. The consumers' population would decrease as the producer's population decreased.

Y4 **Describe the simple functions of the basic parts of the digestive system in humans.**

Skill

Core knowledge

- The digestive system is responsible for digesting food and absorbing nutrients and water.
- The mouth, oesophagus, small intestine and large intestine are organs of the digestive system.

Broad knowledge

The digestive system is responsible for digesting food and absorbing nutrients and water. The main parts of the digestive system are the mouth, oesophagus, stomach, small intestines, large intestines and rectum. The mouth starts digestion by chewing food and mixing it with saliva. The oesophagus transports the chewed food to the stomach, where it mixes with stomach acid and gets broken down into smaller pieces. In the small intestine, nutrients from the food are absorbed by the body. In the large intestine, water is absorbed by the body. The remaining undigested waste is stored in the rectum before excretion through the anus.

Hinterland

Digestion is the process where food is broken down into small particles that can be absorbed by the body. What the body doesn't need is excreted as waste.

Y4 **Identify the different types of teeth in humans and their simple functions.**

Skill

Core knowledge

- A baby grows 20 primary teeth that start to fall out when a child is six years old. They are replaced by 32 adult teeth.
- The four different types of teeth are incisors, canines, premolars and molars.
- Incisors have sharp, straight edges for slicing and cutting food.
- Canines are pointed for gripping and tearing chewy food such as meat.
- Pre-molars and molars are wide and have cusps, for crushing and grinding up food so it is small enough to swallow.

Broad knowledge

There are four different types of teeth: incisors, canines, premolars and molars. Incisors are used for cutting. Canines are used for tearing. Premolars and molars are used for grinding and chewing. Carnivores, herbivores and omnivores have characteristic types of teeth. Herbivores have many large molars for grinding plant material. Carnivores have large canines for killing their prey and tearing meat.

Y4 **Construct and interpret a variety of food chains, identifying producers, predators and prey.**

Skill

Core knowledge

- An ecosystem is a community of living organisms and their environments that are interdependent.
- Ecosystems have biotic, or living, features including plants, animals and microorganisms. They also have abiotic, or non-living, features including sunlight, water, air, soil and temperature.

Core knowledge

- All the different food chains in a specific ecosystem can be linked together. These connected food chains are called a food web.

Broad knowledge

Food chains show what animals eat within a habitat and how energy is passed on over time. All food chains start with a producer, which is typically a green plant. The producer is eaten by a primary consumer (prey), which is eaten by a secondary consumer (prey), which is eaten by a tertiary consumer. All food chains end with a top or apex predator. Changes within a food chain, such as an abundance or lack of one food type, have an impact on the entire food chain.

Hinterland

A food web is a diagram that shows how:

- food chains in an ecosystem link together
- living things in an ecosystem are interdependent
- energy is passed between different plants and animals.

Y4 **Are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.**

Skill

Core knowledge

- Regular teeth brushing, limiting sugary foods and visiting the dentist are important for good oral hygiene.

Broad knowledge

Regular teeth brushing, limiting sugary foods and visiting the dentist are important for good oral hygiene.

Sound

Hide

12 Programmes of study, 12 skills and 14 knowledge statements

Year 4 | Driver subject | Science | Gather & record data | Investigation | Pattern seeking | Phenomena | Questioning | Report and conclude

Y4 **Ask relevant questions and using different types of scientific enquiries to answer them.**

Skill

Core knowledge

- Questions can help us find out about the world and can be answered using scientific enquiry.

Broad knowledge

Questions can help us find out about the world and can be answered using scientific enquiry.

Y4 **Set up simple practical enquiries, comparative and fair tests.**

Skill

Core knowledge

- Scientific enquiries can be set up and carried out by following or planning a method.
- A prediction is a statement about what might happen in an investigation, based on some prior knowledge or understanding.
- A fair test is one in which only one variable is changed and all others remain constant.

Broad knowledge

Scientific enquiries can be set up and carried out by following or planning a method. A prediction is a statement about what might happen in an investigation, based on some prior knowledge or understanding. A fair test is one in which only one variable is changed and all others remain constant.

Hinterland

The volume of sound is measured in decibels (dB). Loud or continuous noise can damage hearing. Sound can be muffled by inserting a material into the sound wave's path that absorbs sound waves.

Y4 **Gather, record, classify and present data in a variety of ways to help in answering questions.**

Skill

Broad knowledge

Data can be recorded and displayed in different ways, including tables, charts, graphs, keys and labelled diagrams.

Y4 **Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.**

Skill

Broad knowledge

Data can be recorded and displayed in different ways, including tables, charts, graphs, keys and labelled diagrams.

Y4 **Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.**

Skill

Core knowledge

- A conclusion is the answer to a question that uses the evidence collected.

Broad knowledge

Results are information, such as data or observations, that have been found out from an investigation. A conclusion is the answer to a question that uses the evidence collected.

Y4 **Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.**

Skill

Core knowledge

- A conclusion is the answer to a question that uses the evidence collected.

Broad knowledge

Results are information, such as data or observations, that have been found out from an investigation. A conclusion is the answer to a question that uses the evidence collected.

Y4 **Use straightforward scientific evidence to answer questions or to support their findings.**

Skill

Core knowledge

- A conclusion is the answer to a question that uses the evidence collected.

Broad knowledge

Results are information, such as data or observations, that have been found out from an investigation. A conclusion is the answer to a question that uses the evidence collected.

Y4 **Identify how sounds are made, associating some of them with something vibrating.**

Skill

Core knowledge

- Sound waves travel through a medium, such as air or water, to the ear.
- A sound source is something that vibrates and creates a sound, such as human vocal cords, part of a musical instrument or a piece of machinery.
- Volume is a measure, in decibels, how loud or quiet sound is.

Core knowledge

- Applying more force to a sound source adds more energy and results in a louder sound.
- Pitch is how high or low a sound is.
- Generally, the longer, looser, bigger and thicker the sound source is the lower the pitch.
- Generally, the shorter, tighter, smaller and thinner the sound source is the higher the pitch.
- Distant and direction of sound can be judged.

Core knowledge 2

- When energy is put into a sound source it starts to vibrate. These vibrations disturb tiny particles of air. They vibrate and collide with each other, creating sound waves.
- When the sound waves enter the ear, the eardrum vibrates. These vibrations pass through small bones, called ossicles, and are turned into electrical signals in the cochlea. They travel to the brain and are interpreted as sounds.
- A sound wave diagram can be drawn as a wavy line with peaks and troughs.
- The distance between two peaks or troughs is called a wavelength.
- The shorter the wavelength the higher the pitch of a sound. The longer the wavelength the lower the pitch of the sound.
- The smaller the peaks and troughs the quieter the sound. The larger the peaks and troughs the louder the sound.

Broad knowledge

When an instrument is played, the air around or inside it vibrates. These vibrations travel as a sound wave. Sound waves travel through a medium, such as air or water, to the ear.

Hinterland

Sound is energy produced by vibrations made by a sound source. Sound travels a lot more slowly than light. There is no sound in space because there is no medium for sound to travel through. Volume is the loudness of a sound and is measured in decibels (dB). Pitch is how high or low a sound is and is measured in hertz. Loud or continuous noise can damage hearing. Hearing can be protected by ear defenders that muffle the sound.

Hinterland

Different parts of musical instruments vibrate to make sounds, including columns of air, strings and drum skins. Hitting, plucking, blowing and bowing create vibrations in musical instruments. When vibrations stop, the sound stops. Volume can be changed by blowing, plucking, hitting or bowing with more or less force. Pitch can be changed by shortening and lengthening strings or columns of air. The size of an instrument and the tightness of a string can also affect pitch. Sound in the environment can be natural or human-made and have different pitches and volumes. We can judge the distance of a sound and also the direction it is coming from.

Hinterland

A sound source is a vibrating object that disturbs particles of air that collide with each other and pass the vibrations along, creating a sound wave. Sound waves travel through a medium and enter the ear, where they are turned into electrical signals that travel to the brain and are interpreted as sound. Sound wave diagrams are drawn with a wavy line that represents the volume and pitch of a sound. Lines with large peaks and troughs are loud, and those with short peaks and troughs are quiet. The distance between the peaks is called a wavelength. Short wavelengths create high-pitched sounds, and long wavelengths create low-pitched sounds.

Hinterland

The pinna funnels sound waves into the ear canal. The vibrations travel along the ear canal until they reach the eardrum, making it vibrate. The vibrations travel through three tiny bones, called ossicles, and then to the inner ear. They travel through the cochlea, where tiny hairs vibrate. The cochlear nerve sends electrical signals from the cochlea to the brain, which interprets them as sounds.

Y4 **Recognise that vibrations from sounds travel through a medium to the ear.**

Skill

Core knowledge

- Sound waves travel through a medium, such as air or water, to the ear.
- A sound source is something that vibrates and creates a sound, such as human vocal cords, part of a musical instrument or a piece of machinery.
- Volume is a measure, in decibels, how loud or quiet sound is.

Core knowledge

- Applying more force to a sound source adds more energy and results in a louder sound.
- Pitch is how high or low a sound is.
- Generally, the longer, looser, bigger and thicker the sound source is the lower the pitch.
- Generally, the shorter, tighter, smaller and thinner the sound source is the higher the pitch.
- Distant and direction of sound can be judged.

Core knowledge 2

- When energy is put into a sound source it starts to vibrate. These vibrations disturb tiny particles of air. They vibrate and collide with each other, creating sound waves.
- When the sound waves enter the ear, the eardrum vibrates. These vibrations pass through small bones, called ossicles, and are turned into electrical signals in the cochlea. They travel to the brain and are interpreted as sounds.
- A sound wave diagram can be drawn as a wavy line with peaks and troughs.
- The distance between two peaks or troughs is called a wavelength.
- The shorter the wavelength the higher the pitch of a sound. The longer the wavelength the lower the pitch of the sound.
- The smaller the peaks and troughs the quieter the sound. The larger the peaks and troughs the louder the sound.

Broad knowledge

When an instrument is played, the air around or inside it vibrates. These vibrations travel as a sound wave. Sound waves travel through a medium, such as air or water, to the ear.

Hinterland

Sound is energy produced by vibrations made by a sound source. Sound travels a lot more slowly than light. There is no sound in space because there is no medium for sound to travel through. Volume is the loudness of a sound and is measured in decibels (dB). Pitch is how high or low a sound is and is measured in hertz. Loud or continuous noise can damage hearing. Hearing can be protected by ear defenders that muffle the sound.

Hinterland

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Hinterland

A sound source is a vibrating object that disturbs particles of air that collide with each other and pass the vibrations along, creating a sound wave. Sound waves travel through a medium and enter the ear, where they are turned into electrical signals that travel to the brain and are interpreted as sound. Sound wave diagrams are drawn with a wavy line that represents the volume and pitch of a sound. Lines with large peaks and troughs are loud, and those with short peaks and troughs are quiet. The distance between the peaks is called a wavelength. Short wavelengths create high-pitched sounds, and long wavelengths create low-pitched sounds.

Hinterland

The pinna funnels sound waves into the ear canal. The vibrations travel along the ear canal until they reach the eardrum, making it vibrate. The vibrations travel through three tiny bones, called ossicles, and then to the inner ear. They travel through the cochlea, where tiny hairs vibrate. The cochlear nerve sends electrical signals from the cochlea to the brain, which interprets them as sounds.

Y4 **Find patterns between the pitch of a sound and features of the object that produced it.**

Skill

Core knowledge

- Pitch is how high or low a sound is.
- Generally, the longer, looser, bigger and thicker the sound source is the lower the pitch.
- Generally, the shorter, tighter, smaller and thinner the sound source is the higher the pitch.

Broad knowledge

Pitch is how high or low a sound is. Parts of an instrument that are shorter, tighter or thinner produce high-pitched sounds. Parts of an instrument that are longer, looser or fatter produce low-pitched sounds.

Y4 **Find patterns between the volume of a sound and the strength of the vibrations that produced it.**

Skill

Core knowledge

- Sounds are louder when more energy is put into a sound source because the vibrations and sound waves are larger.
- The volume of sound is measured in decibels (dB).

Broad knowledge

Volume is how loud or quiet a sound is. The harder an instrument is hit, plucked or blown, the stronger the vibrations and the louder the sound.

Hinterland

The volume of sound is measured in decibels (dB). Sound travels in waves of vibrations. The more energy put into a sound source, the larger the vibrations and the larger the sound waves. This means the sound will be louder. Putting less energy into a sound source creates smaller sound waves, meaning the sound will be quieter.

Y4 **Recognise that sounds get fainter as the distance from the sound source increases.**

Skill

Broad knowledge

Sounds are louder closer to the sound source and fainter as the distance from the sound source increases.

Misty Mountain, Winding River

Hide

2 Programmes of study, 2 skills and 2 knowledge statements

Year 4 | Driver subject | Geography | Earth | Habitats

Y4 **Recognise that environments can change and that this can sometimes pose dangers to living things.**

Skill

Core knowledge

- Humans can affect habitats in negative or positive ways.

Broad knowledge

Humans can affect habitats in negative ways, such as littering, pollution and land development, or positive ways, such as garden ponds, bird boxes and wildflower areas.

Y4 **Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.**

Skill

Core knowledge

- The water cycle has four stages: evaporation, condensation, precipitation (rain) and collection.
- Evaporation and condensation are caused by temperature changes.

Broad knowledge

The water cycle has four stages: evaporation, condensation, precipitation and collection. Water in lakes, rivers and streams is warmed by the Sun, causing the water to evaporate and rise into the air as water vapour. As the water vapour rises, it cools and condenses to form water droplets in clouds. The clouds become full of water until the water falls back to the ground as precipitation (rain, hail, snow and ice). The fallen water collects back in lakes, rivers and streams. Evaporation and condensation are caused by temperature changes.

States of Matter

Hide

10 Programmes of study, 11 skills and 13 knowledge statements

Year 4 | Driver subject | Science | Changes | Gather & record data | Identify & classify | Investigation | Measurement | Observation | Report and conclude

Y4 **Set up simple practical enquiries, comparative and fair tests.**

Skill

Core knowledge

- Scientific enquiries can be set up and carried out by following or planning a method.
- A prediction is a statement about what might happen in an investigation, based on some prior knowledge or understanding.
- A fair test is one in which only one variable is changed and all others remain constant.

Broad knowledge

Scientific enquiries can be set up and carried out by following or planning a method. A prediction is a statement about what might happen in an investigation, based on some prior knowledge or understanding. A fair test is one in which only one variable is changed and all others remain constant.

Hinterland

Factors that affect the rate of ice melting include the size of the ice, the temperature, agitation by stirring and changing its composition.

Y4 **Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.**

Skill

Broad knowledge

Equipment is used to take measurements in standard units. Examples include data loggers plus sensors, timers (seconds, minutes and hours), thermometers (°C), and metre sticks, rulers or trundle wheels (millimetres, centimetres, metres).

Skill

Core knowledge

- Observations can be made regularly to identify changes over time.

Broad knowledge

An observation involves looking closely at objects, materials and living things. Observations can be made regularly to identify changes over time.

Y4 **Gather, record, classify and present data in a variety of ways to help in answering questions.**

Skill

Core knowledge

- A line graph is a way of displaying data that might show a relationship between two things (variables). Many show changes over the time.
- A flat line means that there was no change over time.
- A line with a shallow curve means there was a gradual change over time.
- A line with a steep curve means there was a quick change over time.

Broad knowledge

Data can be recorded and displayed in different ways, including tables, charts, graphs, keys and labelled diagrams.

Hinterland

A line graph is a way of displaying data that shows a relationship between two variables. Many line graphs show changes over time. A flat line means that there was no change over time. A line with a shallow curve means there was a gradual change over time. A line with a steep curve means there was a quick change over time.

Y4 **Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.**

Skill

Core knowledge

- A line graph is a way of displaying data that might show a relationship between two things (variables). Many show changes over the time.
- A flat line means that there was no change over time.
- A line with a shallow curve means there was a gradual change over time.
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Broad knowledge

Data can be recorded and displayed in different ways, including tables, charts, graphs, keys and labelled diagrams.

Hinterland

A line graph is a way of displaying data that shows a relationship between two variables. Many line graphs show changes over time. A flat line means that there was no change over time. A line with a shallow curve means there was a gradual change over time. A line with a steep curve means there was a quick change over time.

Y4 **Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.**

Skill

Core knowledge

- A conclusion is the answer to a question that uses the evidence collected.

Broad knowledge

Results are information, such as data or observations, that have been found out from an investigation. A conclusion is the answer to a question that uses the evidence collected.

Hinterland

Particles make up all materials. The particles are close together and arranged in a regular pattern in a solid. In a liquid, the particles are close together but arranged randomly. In a gas, the particles are randomly arranged and far apart.

Y4 **Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.**

Skill

Core knowledge

- A conclusion is the answer to a question that uses the evidence collected.

Broad knowledge

Results are information, such as data or observations, that have been found out from an investigation. A conclusion is the answer to a question that uses the evidence collected.

Hinterland

Particles make up all materials. The particles are close together and arranged in a regular pattern in a solid. In a liquid, the particles are close together but arranged randomly. In a gas, the particles are randomly arranged and far apart.

Y4 **Identify differences, similarities or changes related to simple scientific ideas and processes.**

Skill

Core knowledge

- Observations can be made regularly to identify changes over time.

Broad knowledge

An observation involves looking closely at objects, materials and living things. Observations can be made regularly to identify changes over time.

Y4 **Use straightforward scientific evidence to answer questions or to support their findings.**

Skill

Core knowledge

- A conclusion is the answer to a question that uses the evidence collected.

Broad knowledge

Results are information, such as data or observations, that have been found out from an investigation. A conclusion is the answer to a question that uses the evidence collected.

Hinterland

Particles make up all materials. The particles are close together and arranged in a regular pattern in a solid. In a liquid, the particles are close together but arranged randomly. In a gas, the particles are randomly arranged and far apart.

Y4 **Compare and group materials together, according to whether they are solids, liquids or gases.**

Skill

Core knowledge

- Materials can be grouped according to whether they are solids, liquids or gases.
- Solids stay in one place and can be held. Some solids can be squashed, bent, twisted and stretched. Examples of solids include wood, metal, plastic and clay.
- Liquids move around (flow) easily and are difficult to hold. Liquids take the shape of the container in which they are held. Examples of liquids include water, juice and milk.
- Gases spread out to fill the available space and cannot be held. Air is a mixture of gases.

Broad knowledge

Materials can be grouped according to whether they are solids, liquids or gases. Solids stay in one place and can be held. Some solids can be squashed, bent, twisted and stretched. Examples of solids include wood, metal, plastic and clay. Liquids move around (flow) easily and are difficult to hold. Liquids take the shape of the container in which they are held. Examples of liquids include water, juice and milk. Gases spread out to fill the available space and cannot be held. Examples of gases include oxygen, helium and carbon dioxide. Air is a mixture of gases.

Y4 **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).**

Skill

Core knowledge

- Heating or cooling materials can bring about a change of state. This change of state can be reversible or irreversible.
- Melting is the process of a solid changing into a liquid.
- Freezing is the process of a liquid changing into a solid.
- Evaporation is the process of a liquid changing into a gas.
- Condensation is the process of a gas changing into a liquid.

Core knowledge

- Temperature is a measure of how hot or cold something is. It is measured in degrees (°) using an instrument called a thermometer.
- The three different scales temperature can be measured in are Celsius (°C), Fahrenheit (°F) and Kelvin (K). We use the Celsius scale in the UK.
- When solid water (ice) is heated to 0°C, it begins to melt. This is called its melting point. When liquid water is cooled to 0°C, it begins to freeze. This called its freezing point.
- When liquid water is heated to 100°C, it begins to evaporate. This is called its boiling point. When gaseous water (water vapour) is cooled to 100°C, it begins to condense. This is called its condensing point.

Core knowledge

- On Earth, temperatures range from around -80°C at their lowest to around 50°C at their highest.
- Materials exist as solids, liquids or gases.
- A material's state on Earth depends on Earth's temperature because materials have different melting and boiling point.

Broad knowledge

Heating or cooling materials can bring about a change of state. This change of state can be reversible or irreversible. The temperature at which materials change state varies depending on the material. Water changes state from solid (ice) ⇌ liquid (water) at 0°C and from liquid (water) ⇌ gas (water vapour) at 100°C. The process of changing from a solid to liquid is called melting. The reverse process of changing from a liquid to a solid is called freezing. The process of changing from a liquid to a gas is called evaporation. The reverse process of changing from a gas to a liquid is called condensation.

Hinterland

The temperature when a solid begins to melt is called its melting point. The temperature when a liquid begins to freeze is called its freezing point. The temperature when a liquid begins to evaporate is called its boiling point. The temperature when a gas begins to condense is called its condensing point.

Hinterland

Temperature is a measure of how hot or cold something is. It is measured in degrees using an instrument called a thermometer. In the United Kingdom, temperature is measured in degrees Celsius.

Hinterland

Different materials have different melting and boiling points. A material's state on Earth depends on Earth's temperature.

Grouping and Classifying

Hide

10 Programmes of study, 10 skills and 11 knowledge statements

Year 4 | Driver subject | Science | Gather & record data | Identify & classify | Observation | Questioning | Report and conclude

Y4 **Ask relevant questions and using different types of scientific enquiries to answer them.**

Skill

Core knowledge

- Questions can help us find out about the world and can be answered using scientific enquiry.

Broad knowledge

Questions can help us find out about the world and can be answered using scientific enquiry.

Y4 **Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.**

Skill

Core knowledge

- Classification is the arrangement of living and non-living things into groups or categories. Single-stage classification involves separating a large group of objects into smaller groups based on a single property.

Broad knowledge

An observation involves looking closely at objects, materials and living things. Observations can be made regularly to identify changes over time.

Hinterland

Classification is the arrangement of living and non-living things into groups or categories. Single-stage classification involves separating a large group of objects into smaller groups based on a single property. Multi-stage classification involves sorting groups into subgroups repeatedly until all the objects in one group are the same. Serial ordering involves sorting objects into an order based on a property.

Y4 **Gather, record, classify and present data in a variety of ways to help in answering questions.**

Skill

Core knowledge 2

- Classification keys are created by devising a set of yes or no questions that separate a group into two groups until objects end up on their own.

Broad knowledge

Data can be recorded and displayed in different ways, including tables, charts, graphs, keys and labelled diagrams.

Hinterland

Classification keys are created by devising a set of yes or no questions that separate a group into two groups until objects end up on their own. Classification keys are also called dichotomous keys or branching trees.

Y4 **Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.**

Skill

Core knowledge 2

- Classification keys are created by devising a set of yes or no questions that separate a group into two groups until objects end up on their own.

Broad knowledge

Data can be recorded and displayed in different ways, including tables, charts, graphs, keys and labelled diagrams.

Hinterland

Classification keys are created by devising a set of yes or no questions that separate a group into two groups until objects end up on their own. Classification keys are also called dichotomous keys or branching trees.

Y4 **Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.**

Skill

Core knowledge

- A conclusion is the answer to a question that uses the evidence collected.

Broad knowledge

Results are information, such as data or observations, that have been found out from an investigation. A conclusion is the answer to a question that uses the evidence collected.

Hinterland

All vertebrates are covered with skin, feathers, scales, fur or hair. They give birth to live young or lay eggs. They can be cold blooded or warm blooded.

Y4 **Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.**

Skill

Core knowledge

- A conclusion is the answer to a question that uses the evidence collected.

Broad knowledge

Results are information, such as data or observations, that have been found out from an investigation. A conclusion is the answer to a question that uses the evidence collected.

Hinterland

All vertebrates are covered with skin, feathers, scales, fur or hair. They give birth to live young or lay eggs. They can be cold blooded or warm blooded.

Y4 **Identify differences, similarities or changes related to simple scientific ideas and processes.**

Skill

Core knowledge

- Classification is the arrangement of living and non-living things into groups or categories. Single-stage classification involves separating a large group of objects into smaller groups based on a single property.

Broad knowledge

An observation involves looking closely at objects, materials and living things. Observations can be made regularly to identify changes over time.

Hinterland

Classification is the arrangement of living and non-living things into groups or categories. Single-stage classification involves separating a large group of objects into smaller groups based on a single property. Multi-stage classification involves sorting groups into subgroups repeatedly until all the objects in one group are the same. Serial ordering involves sorting objects into an order based on a property.

Y4 **Use straightforward scientific evidence to answer questions or to support their findings.**

Skill

Core knowledge

- A conclusion is the answer to a question that uses the evidence collected.

Broad knowledge

Results are information, such as data or observations, that have been found out from an investigation. A conclusion is the answer to a question that uses the evidence collected.

Hinterland

All vertebrates are covered with skin, feathers, scales, fur or hair. They give birth to live young or lay eggs. They can be cold blooded or warm blooded.

Y4 **Recognise that living things can be grouped in a variety of ways.**

Skill

Core knowledge

- A classification key is a set of questions that helps us identify a living thing or decide which group it belongs to.

Core knowledge

- The animal kingdom is divided into vertebrates and invertebrates.
- A vertebrate is an animal with a backbone.
- An invertebrate is an animal without a backbone.

Core knowledge

- Invertebrates usually have soft bodies or a hard outer shell or covering called an exoskeleton.

Core knowledge

- The plant kingdom is divided into vascular and non-vascular plants.
- Vascular plants have tiny tubes or vessels that carry water, nutrients and provide structure.

- Plants with seeds and plants with spores are the two main types of vascular plants.
- Flowering and cone-bearing plants are the two groups of plants with seeds.

Broad knowledge

Scientists classify living things according to shared characteristics. Animals can be divided into six main groups: mammals, reptiles, amphibians, birds, fish and invertebrates. These groups can be further subdivided. Classification keys are scientific tools that aid the identification of living things.

Hinterland

The animal kingdom is divided into vertebrates and invertebrates. A vertebrate is an animal with a backbone. An invertebrate is an animal without a backbone. All vertebrates are covered with skin, feathers, scales, fur or hair. Invertebrates usually have soft bodies or a hard outer shell or covering called an exoskeleton.

Hinterland

Invertebrates usually have soft bodies or a hard outer shell or covering called an exoskeleton. There are six main groups of invertebrates: annelids, molluscs, arachnids, crustaceans, insects and myriapods.

Hinterland

The plant kingdom is divided into vascular and non-vascular plants. There are two main types of vascular plants: plants with seeds and plants with spores. There are two groups of plants with seeds: flowering plants and cone-bearing plants.

Y4 **Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.**

Skill

Core knowledge

- Scientists classify living things according to shared characteristics.

Core knowledge

- The animal kingdom is divided into vertebrates and invertebrates.
- A vertebrate is an animal with a backbone.
- An invertebrate is an animal without a backbone.

Core knowledge

- Invertebrates usually have soft bodies or a hard outer shell or covering called an exoskeleton.

Core knowledge

- The plant kingdom is divided into vascular and non-vascular plants.
- Vascular plants have tiny tubes or vessels that carry water, nutrients and provide structure.
- Plants with seeds and plants with spores are the two main types of vascular plants.
- Flowering and cone-bearing plants are the two groups of plants with seeds.

Broad knowledge

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Hinterland

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Hinterland

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Hinterland

The plant kingdom is divided into vascular and non-vascular plants. There are two main types of vascular plants: plants with seeds and plants with spores. There are two groups of plants with seeds: flowering plants and cone-bearing plants.

Electrical Circuits and Conductors

Hide

15 Programmes of study, 15 skills and 14 knowledge statements

Year 4 | Driver subject | Science | Forces | Gather & record data | Investigation | Modelling | Observation | Physical things | Properties and uses | Questioning | Report and conclude | Staying safe

Y4 **Ask relevant questions and using different types of scientific enquiries to answer them.**

Skill

Core knowledge

- Questions can help us find out about the world and can be answered using scientific enquiry.

Broad knowledge

Questions can help us find out about the world and can be answered using scientific enquiry.

Y4 **Set up simple practical enquiries, comparative and fair tests.**

Skill

Core knowledge

- Scientific enquiries can be set up and carried out by following or planning a method.
- A prediction is a statement about what might happen in an investigation, based on some prior knowledge or understanding.
- A fair test is one in which only one variable is changed and all others remain constant.

Broad knowledge

Scientific enquiries can be set up and carried out by following or planning a method. A prediction is a statement about what might happen in an investigation, based on some prior knowledge or understanding. A fair test is one in which only one variable is changed and all others remain constant.

Y4 **Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.**

Skill

Core knowledge

- Observations can be made regularly to identify changes over time.

Broad knowledge

An observation involves looking closely at objects, materials and living things. Observations can be made regularly to identify changes over time.

Y4 **Gather, record, classify and present data in a variety of ways to help in answering questions.**

Skill

Core knowledge

- A line graph is a way of displaying data that might show a relationship between two things (variables). Many show changes over the time.
- A flat line means that there was no change over time.
- A line with a shallow curve means there was a gradual change over time.
- A line with a steep curve means there was a quick change over time.

Broad knowledge

Data can be recorded and displayed in different ways, including tables, charts, graphs, keys and labelled diagrams.

Y4 **Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.**

Skill

Core knowledge

- A line graph is a way of displaying data that might show a relationship between two things (variables). Many show changes over the time.
- A flat line means that there was no change over time.
- A line with a shallow curve means there was a gradual change over time.
- A line with a steep curve means there was a quick change over time.

Broad knowledge

Data can be recorded and displayed in different ways, including tables, charts, graphs, keys and labelled diagrams.

Y4 **Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.**

Skill

Core knowledge

- A conclusion is the answer to a question that uses the evidence collected.

Broad knowledge

Results are information, such as data or observations, that have been found out from an investigation. A conclusion is the answer to a question that uses the evidence collected.

Y4 **Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.**

Skill

Core knowledge

- A conclusion is the answer to a question that uses the evidence collected.

Broad knowledge

Results are information, such as data or observations, that have been found out from an investigation. A conclusion is the answer to a question that uses the evidence collected.

Y4 **Identify differences, similarities or changes related to simple scientific ideas and processes.**

Skill

Core knowledge

- Observations can be made regularly to identify changes over time.

Broad knowledge

An observation involves looking closely at objects, materials and living things. Observations can be made regularly to identify changes over time.

Y4 **Use straightforward scientific evidence to answer questions or to support their findings.**

Skill

Core knowledge

- A conclusion is the answer to a question that uses the evidence collected.

Broad knowledge

Results are information, such as data or observations, that have been found out from an investigation. A conclusion is the answer to a question that uses the evidence collected.

Y4 **Identify common appliances that run on electricity.**

Skill

Core knowledge

- Electricity is a type of energy. It is used to power many everyday items.
- Electricity comes from two sources, mains and batteries.

Broad knowledge

Electricity is a type of energy. It is used to power many everyday items, such as kettles, computers and televisions. Electricity can also come from batteries. Batteries eventually run out of power and need to be recycled or recharged. Batteries power devices that can be carried around, such as mobile phones and torches.

Hinterland

Electricity is essential to our daily lives and makes peoples' lives easier. Electricity comes from two sources, mains and batteries.

Y4 **Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.**

Skill

Core knowledge

- A circuit is a collection of components connected by wires through which an electric current can flow.
- A circuit must be a complete loop to work.

Core knowledge

- A series circuit has a single path for an electric current to flow through.

Broad knowledge

Electrical components include cells, wires, lamps, motors, switches and buzzers. Switches open and close a circuit and provide control.

Hinterland

A circuit is a collection of components connected by wires through which an electric current can flow. A circuit must be a complete loop to work.

Hinterland 2

A series circuit has a single path for an electric current to flow through.

Y4 **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.**

Skill

Core knowledge

- A series circuit must be a complete loop to work and have a source of power from a battery or cell.

Broad knowledge

A series circuit is a simple loop with only one path for the electricity to flow. A series circuit must be a complete loop to work and have a source of power from a battery or cell.

Y4 **Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.**

Skill

Core knowledge

- A circuit is a collection of components connected by wires through which an electric current can flow.
- A circuit must be a complete loop to work.

Core knowledge

- A series circuit has a single path for an electric current to flow through.

Broad knowledge

Electrical components include cells, wires, lamps, motors, switches and buzzers. Switches open and close a circuit and provide control.

Hinterland

A circuit is a collection of components connected by wires through which an electric current can flow. A circuit must be a complete loop to work.

Hinterland 2

A series circuit has a single path for an electric current to flow through.

Y4 **Recognise some common conductors and insulators, and associate metals with being good conductors.**

Skill

Core knowledge 2

- Electrical conductivity is a measure of a material's ability to allow an electric current to pass through it.
- Electrical conductors, like metals, have low resistence and allow electricity to flow through them.
- Non-conductive materials, like plastics, are often known as electrical insulators they do not let electricity through, they have high resistance.

Broad knowledge

Electrical conductors allow electricity to flow through them, whereas insulators do not. Common electrical conductors are metals. Common insulators include wood, glass, plastic and rubber.

Hinterland

Plugs and cabling are made from a combination of conductive and insulating materials. Insulating plastic covers conductive metals to make plugs safe to use.

Y4 **Develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics.**

Skill

Core knowledge

- Working with electrical circuits can be dangerous.

Broad knowledge

Working with electrical circuits can be dangerous. Precautions include not touching electrical components with wet hands and not putting batteries in mouths.

Forces and Mechanisms

Hide

9 Programmes of study, 11 skills and 21 knowledge statements

Year 5 | Driver subject | Science | Forces | Gather & record data | Investigation | Measurement | Modelling | Observation | Phenomena | Questioning

Report and conclude

Y5 **Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.**

Skill

Broad knowledge

A method is a set of clear instructions for how to carry out a scientific investigation. A prediction is a statement about what might happen in an investigation based on some prior knowledge or understanding.

Skill

Core knowledge

- Questions can help us find out about the world and can be answered using a range of scientific enquiries.

Broad knowledge

Questions can help us find out about the world and can be answered using a range of scientific enquiries.

Y5 **Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.**

Skill

Core knowledge

- A force meter can be used to measure an object's mass in grams (g) or kilograms (kg) and its weight in newtons (N).
- Many people commonly mix up and misuse the words mass and weight.
- Mass is the amount of matter that an object or substance contains.
- Weight is a measure of gravitational force which is different on for example Earth and the Moon.

Broad knowledge

Specialised equipment is used to take measurements in standard units. Examples include data loggers plus sensors, such as light (lux), sound (dB) and temperature (°C); timers (seconds, minutes and hours); thermometers (°C), and measuring tapes (millimetres, centimetres, metres).

Hinterland

A force meter can be used to measure an object's mass in grams (g) or kilograms (kg) and its weight in newtons (N).

Hinterland

A line graph can be used to show the correlation between an object's mass and its weight.

Skill

Core knowledge

- Accurate observations can be made repeatedly or at regular intervals to identify changes over time.

Broad knowledge

An observation involves looking closely at objects, materials and living things. Accurate observations can be made repeatedly or at regular intervals to identify changes over time.

Y5 **Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.**

Skill

Core knowledge

- Data can be recorded and displayed in different ways, including tables, bar and line charts, classification keys and labelled diagrams.

Broad knowledge

Data can be recorded and displayed in different ways, including tables, bar and line charts, classification keys and labelled diagrams.

Y5 **Use test results to make predictions to set up further comparative and fair tests.**

Skill

Core knowledge

- A conclusion is an explanation of what has been discovered using evidence collected.

Broad knowledge

The results are information, such as measurements or observations, that have been collected during an investigation. A conclusion is an explanation of what has been discovered using evidence collected.

Hinterland

A force is a push or a pull that makes something move, change its speed or change its shape. There are two types of forces: contact forces and non-contact forces. Contact forces include friction, air resistance and water resistance. Non-contact forces include magnetism and gravitational force, or gravity.

Y5 **Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.**

Skill

Core knowledge

- A conclusion is an explanation of what has been discovered using evidence collected.

Broad knowledge

The results are information, such as measurements or observations, that have been collected during an investigation. A conclusion is an explanation of what has been discovered using evidence collected.

Hinterland

A force is a push or a pull that makes something move, change its speed or change its shape. There are two types of forces: contact forces and non-contact forces. Contact forces include friction, air resistance and water resistance. Non-contact forces include magnetism and gravitational force, or gravity.

Y5 **Identify scientific evidence that has been used to support or refute ideas or arguments.**

Skill

Core knowledge

- A conclusion is an explanation of what has been discovered using evidence collected.

Broad knowledge

The results are information, such as measurements or observations, that have been collected during an investigation. A conclusion is an explanation of what has been discovered using evidence collected.

Hinterland

A force is a push or a pull that makes something move, change its speed or change its shape. There are two types of forces: contact forces and non-contact forces. Contact forces include friction, air resistance and water resistance. Non-contact forces include magnetism and gravitational force, or gravity.

Y5 **Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.**

Skill

Core knowledge

- Gravitational force, or gravity, is a non-contact, pulling force between objects that have mass.
- Gravitational force increases as the mass of an object increases.
- The mass of the Earth is very large so it exerts a gravitational force large enough for its effects to be seen.

Broad knowledge

Gravity is a force of attraction. Anything with a mass can exert a gravitational pull on another object. The Earth's large mass exerts a gravitational pull on all objects on Earth, making dropped objects fall to the ground.

Hinterland

Gravity is a non-contact, pulling force which attracts two objects that have mass.

Y5 **Identify the effects of air resistance, water resistance and friction, that act between moving surfaces.**

Skill

Core knowledge 2

- Friction, air resistance and water resistance are forces that oppose motion and slow down moving objects.
- Lubricants reduce the contact between two surfaces and therefore reduce frictional forces.
- Liquids, such as water and oil, are used as lubricants.
- Heat caused by friction can damage moving parts and stop machines from working.
- Friction can be reduced through streamlining or the use of lubricants and ball bearings between surfaces or using materials with different properties.

Core knowledge 2

- The larger the surface area of an object the greater the resistance, air or water, it will have when it moves. This will slow it down.
- Designing objects to have a smaller surface area and streamlined shape decreases resistance, air or water, and allows them to move more quickly through the air.

Broad knowledge

Friction, air resistance and water resistance are forces that oppose motion and slow down moving objects. These forces can be useful, such as bike brakes and parachutes, but sometimes we need to minimise their effects, such as streamlining boats and planes to move through water or air more easily and using lubricants and ball bearings between two surfaces to reduce friction.

Hinterland

Different surfaces create different amounts of friction. Smooth, flat surfaces exert a smaller frictional force than rough, bumpy surfaces. Moving objects will travel further on surfaces with less friction.

Hinterland

Air resistance is a type of friction. It is a contact force that acts when an object moves through air. It always acts against the direction of movement.

Hinterland

Increasing air resistance makes an object fall to Earth more slowly.

Hinterland

Water resistance is a type of friction. It is a contact force that acts when an object moves through water. It always acts against the direction of movement.

Hinterland

Decreasing the surface area at the front of an object reduces the amount of water resistance. The more streamlined an object, the faster it will fall through water.

Y5 **Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.**

Skill

Core knowledge

- Mechanisms, such as levers, pulleys and gears, give us a mechanical advantage. The bigger the mechanical advantage, the less force we need to apply.

Core knowledge

- A lever is a simple machine that provides a mechanical advantage to make it easier to lift a heavy load.
- A lever consists of a lever arm, a fulcrum, a load and effort. As the distance between the fulcrum and the effort increases, the effort needed to lift a load decreases.

Core knowledge

- A pulley is a simple machine that provides a mechanical advantage to make it easier to lift a heavy load.
- A pulley consists of one or more grooved wheels and a rope. As the number of wheels, and the number of pieces of rope supporting the pulleys, increases, the effort needed to lift an object decreases, but the distance the rope has to be pulled increases.

Core knowledge

- Gears are toothed, interlocking wheels that can be place together to make a mechanism that provides a mechanical advantage.
- Linking different sized gears creates a mechanical advantage. Smaller gears rotate more quickly and are easier to turn but do not provide much force. Larger gears rotate more slowly and are harder to turn but provide more force.

Broad knowledge

Mechanisms, such as levers, pulleys and gears, give us a mechanical advantage. A mechanical advantage is a measurement of how much a simple machine multiplies the force that we put in. The bigger the mechanical advantage, the less force we need to apply.

Hinterland

A lever is a simple machine that provides a mechanical advantage to make it easier to lift a heavy load. It consists of a lever arm, a fulcrum, a load and effort. As the distance between the fulcrum and the effort increases, the effort needed to lift a load decreases.

Hinterland

A pulley is a simple machine that provides a mechanical advantage to make it easier to lift a heavy load. It consists of one or more grooved wheels and a rope. As the number of wheels, and the number of pieces of rope supporting the pulleys, increases, the effort needed to lift an object decreases, but the distance the rope has to be pulled increases.

Hinterland

Gears are toothed, interlocking wheels that can be place together to make a mechanism that provides a mechanical advantage. Linking gears of the same size does not provide a mechanical advantage. Linking different sized gears does create a mechanical advantage. Smaller gears rotate more quickly and are easier to turn but do not provide much force. Larger gears rotate more slowly and are harder to turn but provide more force. Gears are used in bicycles to make it easier to cycle uphill and faster to cycle on the flat.

Earth and Space

Hide

8 Programmes of study, 8 skills and 14 knowledge statements

Year 5 | Driver subject | Science | Earth | Pattern seeking | Phenomena | Questioning | Report and conclude

Y5 **Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.**

Skill

Core knowledge

- Questions can help us find out about the world and can be answered using a range of scientific enquiries.

Broad knowledge

Questions can help us find out about the world and can be answered using a range of scientific enquiries.

Hinterland

Aristotle (c384–c322 BC) used observation to suggest a geocentric model of the Solar System with Earth at its centre. Claudius Ptolemy (AD c100–c170) used mathematics, and Alhazen (AD c965–c1040) used experiments and scientific methods to agree with Aristotle's ideas. Nicolaus Copernicus (1473–1543) developed a theory that the Sun was at the centre of the Solar System. This was called the heliocentric model. Galileo Galilei (1564–1642) used a telescope to observe planets, stars and Moons more clearly and agreed with Copernicus. Sir Isaac Newton (1643–1727) studied the work of other scientists, used scientific methods, including observation and developed laws that proved the heliocentric model of the Solar System.

Y5 **Use test results to make predictions to set up further comparative and fair tests.**

Skill

Core knowledge

- A conclusion is an explanation of what has been discovered using evidence collected.

Broad knowledge

The results are information, such as measurements or observations, that have been collected during an investigation. A conclusion is an explanation of what has been discovered using evidence collected.

Y5 **Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.**

Skill

Core knowledge

- A conclusion is an explanation of what has been discovered using evidence collected.

Broad knowledge

The results are information, such as measurements or observations, that have been collected during an investigation. A conclusion is an explanation of what has been discovered using evidence collected.

Y5 **Identify scientific evidence that has been used to support or refute ideas or arguments.**

Skill

Core knowledge

- A conclusion is an explanation of what has been discovered using evidence collected.

Broad knowledge

The results are information, such as measurements or observations, that have been collected during an investigation. A conclusion is an explanation of what has been discovered using evidence collected.

Y5 **Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.**

Skill

Core knowledge 2

- The Solar System is made up of the Sun and everything that orbits around it.
- The Sun is a huge, hot ball of gas and is the only source of heat and light in the Solar System.
- The Sun's force of gravity, created by its huge mass, keeps the planets in orbit.
- The eight planets in our Solar System are Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.

Core knowledge

- The tilt of the Earth's axis as it orbits the Sun changes the length of daytime and night time and creates different seasons.
- When the Northern or Southern Hemisphere tilts away from the Sun, it is winter. It gets less direct sunlight, the weather is colder, the daytime is shorter and the night time is longer.
- When the Northern or Southern Hemisphere tilts towards the Sun, it is summer. It gets plenty of direct sunlight, the weather is warmer, the daytime is longer and the night time is shorter.
- When it is winter in the Northern Hemisphere it summer in the Southern Hemisphere.

Core knowledge

- Earth orbits around the Sun. The length of time it takes for Earth to complete a full orbit is 365.25 days, one year.
- The Earth completes one rotation on its axis in 24 hours, one day.

Broad knowledge

The Solar System is made up of the Sun and everything that orbits around it. There are eight planets in our Solar System: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune. Earth orbits around the Sun and a year (365.25 days) is the length of time it takes for Earth to complete a full orbit.

Hinterland

The Sun is a huge, hot ball of gas and is the only source of heat and light in the Solar System. The Sun's force of gravity, created by its huge mass, keeps the planets in orbit. The planets closer to the Sun (Mercury, Venus, Earth and Mars) are made of rock. They are hotter and have a shorter orbit and a shorter year than the planets farther away. Planets farther from the Sun (Jupiter, Saturn, Uranus and Neptune) are made of gas. They are colder and have a larger orbit and a longer year than the closer planets. The Moon orbits the Earth every 27.3 days and rotates every 27.3 days, so we only see one side from Earth. Different amounts of the lit side can be seen from Earth during each month and are called the phases of the Moon. The Earth rotates on its axis once every 24 hours, which is a day. This rotation creates daytime and night time. The Earth's axis is tilted at an angle of 23.5°. This tilt creates the different seasons on Earth each year as the Earth orbits the Sun.

Hinterland

The tilt of the Earth's axis as it orbits the Sun changes the length of daytime and night time and creates different seasons. When the Northern Hemisphere tilts away from the Sun, it is winter. It gets less direct sunlight, the weather is colder, the daytime is shorter, and the night time is longer. The Arctic Circle gets no sunlight in winter, so it is always night time. At the same time, the Southern Hemisphere tilts towards the Sun, which is summer. It gets plenty of direct sunlight, the weather is warmer, the daytime is longer, and the night time is shorter. Antarctica has daylight all day, and it is never night time. As the Earth continues its orbit, the day lengths and the seasons in the hemispheres continually change. Countries in the tropics that are on or near the Equator get a similar amount of direct sunlight all year round because the Equator is in a similar position throughout the Earth's orbit. The weather is warm, the length of daytime and night time are similar, and there are two seasons, a rainy season and a dry season.

Hinterland

The Moon orbits the Earth once every 27.3 days. The Moon also rotates on its axis once every 27.3 days. This is why the same side of the Moon always faces Earth. Earth also rotates on its axis, an imaginary line that runs through Earth’s centre from the North Pole to the South Pole. Earth completes one rotation in 24 hours. This is equal to one day.

Y5 **Describe the movement of the Moon relative to the Earth.**

Skill

Core knowledge

- The Moon orbits the Earth once every 27.3 days and also rotates on its axis once every 27.3 days.

Core knowledge

- The Moon is Earth’s only natural satellite.
- The Moon is about 385,000km from the Earth.
- The Moon is not a natural light source. We can only see it because it reflects the Sun’s light.

Broad knowledge

The Moon orbits Earth, completing a full orbit every month (27.3 days).

Hinterland

The Moon orbits the Earth in an anti-clockwise direction as viewed from the North Pole. It rotates on its axis once every 27.3 days, the same time it takes to complete one orbit of the Earth, so the same side of the Moon always faces the Earth. The Moon appears lit up because it reflects sunlight. As the Moon completes one orbit of the Earth, our view of the lit side gradually changes. This changing view is called the phases of the Moon, of which there are eight: new Moon, waxing crescent Moon, first quarter Moon, waxing gibbous Moon, full Moon, waning gibbous Moon, last quarter Moon and waning crescent Moon. Waxing means to increase and waning means to decrease.

Y5 **Describe the Sun, Earth and Moon as approximately spherical bodies.**

Skill

Core knowledge 2

- All planets are spherical because their mass is so large that they have their own force of gravity. This force of gravity pulls all of a planet’s material towards its centre, which compresses it into the most compact shape – a sphere.

Broad knowledge

The Sun, Earth, Moon and the planets in our solar system are roughly spherical. All planets are spherical because their mass is so large that they have their own force of gravity. This force of gravity pulls all of a planet’s material towards its centre, which compresses it into the most compact shape – a sphere.

Hinterland

Many ancient civilisations believed that the Earth was flat. Aristotle (384 BC-322 BC) observed that when a ship sailed over the horizon, the bottom part of the ship disappeared from view. As it sailed further away, it disappeared from view from the hull upwards, indicating that the Earth was spherical.

Hinterland

A solar eclipse happens when the Moon passes directly between the Earth and the Sun, blocking our view of the Sun and casting a shadow on the Earth. It can only happen when there is a new Moon and when the Sun, Moon and Earth are all in a line. It is only visible from those places on Earth where the Moon's shadow falls. A solar eclipse does not occur every month; the Moon only passes directly between the Earth and the Sun a few times a year. A lunar eclipse is when the Earth is in line between the Moon and the Sun, casting a shadow on the Moon. It can only happen when there is a full Moon. Lunar eclipses occur a few times a year.

Y5 **Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.**

Skill

Core knowledge

- As Earth orbits the Sun, it also spins on its axis. It takes Earth a day (24 hours) to complete a full spin.
- During the day, the Sun appears to move through the sky. The Sun is not moving the Earth is rotating.
- Earth rotates to the east or, if viewed from above the North Pole, it rotates anti-clockwise, which means the Sun rises in the east and sets in the west.
- As Earth rotates, different parts of it face the Sun, which brings what we call daytime. The part facing away is in shadow, which is night time.

Core knowledge

- Sundials block sunlight to cast a shadow. As the Earth rotates, the angle of the sunlight upon the sundial changes, and the shadow changes length and direction.

Broad knowledge

As Earth orbits the Sun, it also spins on its axis. It takes Earth a day (24 hours) to complete a full spin. During the day, the Sun appears to move through the sky. However, this is due to the Earth rotating and not the Sun moving. Earth rotates to the east or, if viewed from above the North Pole, it rotates anti-clockwise, which means the Sun rises in the east and sets in the west. As Earth rotates, different parts of it face the Sun, which brings what we call daytime. The part facing away is in shadow, which is night time.

Hinterland

A sundial consists of a disc plate marked with numbers or Roman numerals and a gnomon. Sundials block sunlight to cast a shadow which indicates the time of day. As the Earth rotates, the angle of the sunlight upon the sundial changes, and the shadow changes length and direction.

Sow, Grow and Farm

Hide

5 Programmes of study, 7 skills and 9 knowledge statements

Year 5 | Driver subject | Geography | Habitats | Identify & classify | Investigation | Nutrition | Parts and functions | Physical things | Survival

Y5 **Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.**

Skill

Broad knowledge

A method is a set of clear instructions for how to carry out a scientific investigation. A prediction is a statement about what might happen in an investigation based on some prior knowledge or understanding.

Y5 **Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.**

Skill

Core knowledge

- Embryo, juvenile, adolescent and adult are stages of a mammal's life cycle.
- Egg, larva (tadpole), adolescent and adult are stages of an amphibian's life cycle..
- Egg, larva, pupa and adult are the stages of some insects including butterflies, beetles and bees.
- Egg, baby, adolescent and adult are stages of a bird's life cycle.

Broad knowledge

A life cycle is the series of changes in the life of a living thing and includes these basic stages: birth, growth, reproduction and death. Mammals' life cycles include the stages: embryo, juvenile, adolescent and adult. Amphibians' life cycles include the stages: egg, larva (tadpole), adolescent and adult. Some insects' (butterflies, beetles and bees) life cycles include the stages: egg, larva, pupa and adult. Birds' life cycles include the stages: egg, baby, adolescent and adult.

Y5 **Describe the life process of reproduction in some plants and animals.**

Skill

Core knowledge

- Flowering plants reproduce sexually. The flower is essential for sexual reproduction. Other plants reproduce asexually.
- Asexual reproduction involves one parent and produces offspring that is identical to the parent.

Broad knowledge

Flowering plants reproduce sexually. The flower is essential for sexual reproduction. Other plants reproduce asexually. Bulbs, corms and rhizomes are some parts used in asexual reproduction in plants.

Skill

Core knowledge

- Parts of a flower include the stamen, filament, anther, pollen, carpel, stigma, style, ovary, ovule and sepal.

Broad knowledge

Parts of a flower include the stamen, filament, anther, pollen, carpel, stigma, style, ovary, ovule and sepal. Pollination is when the male part of a plant (pollen) is carried, by wind, insects or other animals, to the female part of the plant (carpel). The pollen travels to the ovary, where it fertilises the ovules (eggs). Seeds are then produced, which disperse far away from the parent plant and grow new plants.

Skill

Core knowledge

- Sexual reproduction is the process of producing offspring and is essential for the continued survival of a species.
- Asexual reproduction involves one parent and produces offspring that is identical to the parent.

Broad knowledge

Reproduction is the process of producing offspring and is essential for the continued survival of a species. There are two types of reproduction: sexual and asexual. Sexual reproduction involves two parents (one female and one male) and produces offspring that are different from the parents. Asexual reproduction involves one parent and produces offspring that is identical to the parent.

Y5 **Develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics.**

Skill

Core knowledge

- Population changes in a habitat can have significant consequences for food chains and webs.

Broad knowledge

Population changes in a habitat can have significant consequences for food chains and webs.

Hinterland

A food web is a set of interconnected food chains that show how animals rely on plants and other animals for food.

Y5 **Are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.**

Skill

Core knowledge 2

- Arable (growing crops), pastoral (raising livestock), mixed (arable and pastoral) are the three main types fo farming in the UK.
- Intensive farming in the past has resulted in the loss of habitats.

Broad knowledge

Farming in the UK can be divided into three main types: arable (growing crops), pastoral (raising livestock), mixed (arable and pastoral). Intensive farming in the past has resulted in the loss of habitats.

Hinterland

Modern farming methods, such as excessive tillage, monoculture, removal of hedgerows, use of synthetic fertilisers and chemical pesticides, irrigation technologies and autumn planting, all impact on wildlife and the natural environment.

Human Reproduction and Ageing

Hide

10 Programmes of study, 13 skills and 22 knowledge statements

Year 5 | Driver subject | Science | Gather & record data | Healthy lifestyle | Human body | Investigation | Living things | Measurement | Observation | Physical things | Questioning | Report and conclude | Survival

Y5 **Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.**

Skill

Broad knowledge

A method is a set of clear instructions for how to carry out a scientific investigation. A prediction is a statement about what might happen in an investigation based on some prior knowledge or understanding.

Hinterland

Juveniles go through rapid growth, change and development over time. They become taller, talk and walk, learn new skills, such as reading and writing, and change from wholly dependent babies to more independent school children.

Skill

Core knowledge

- Questions can help us find out about the world and can be answered using a range of scientific enquiries.

Broad knowledge

Questions can help us find out about the world and can be answered using a range of scientific enquiries.

Hinterland

As humans age, many of the body's systems gradually decline, leading to the changes seen in older people. These changes include the loss of eyesight and hearing, greying hair, wrinkled skin, weakened bones, joints and muscles, heart problems, memory loss, and brain function problems.

Y5 **Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.**

Skill

Broad knowledge

Specialised equipment is used to take measurements in standard units. Examples include data loggers plus sensors, such as light (lux), sound (dB) and temperature (°C); timers (seconds, minutes and hours); thermometers (°C), and measuring tapes (millimetres, centimetres, metres).

Skill

Core knowledge

- Accurate observations can be made repeatedly or at regular intervals to identify changes over time.

Broad knowledge

An observation involves looking closely at objects, materials and living things. Accurate observations can be made repeatedly or at regular intervals to identify changes over time.

Y5 **Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.**

Skill

Core knowledge

- Data can be recorded and displayed in different ways, including tables, bar and line charts, classification keys and labelled diagrams.

Broad knowledge

Data can be recorded and displayed in different ways, including tables, bar and line charts, classification keys and labelled diagrams.

Hinterland

A scatter graph is used when we have two sets of data, called variables, and we want to see a relationship between them. If there is a relationship between the variables, it is called a correlation. If there is no relationship between the variables, it is called no correlation.

Hinterland

In general, mammals with a smaller mass have a shorter gestation period, and mammals with a larger mass have a longer gestation period.

Hinterland

Humans are mammals and have a mammalian life cycle.

Y5 **Use test results to make predictions to set up further comparative and fair tests.**

Skill

Core knowledge

- A conclusion is an explanation of what has been discovered using evidence collected.

Core knowledge

- Human growth charts are line graphs that show the predicted growth of juveniles and adolescents up to 18.

Broad knowledge

The results are information, such as measurements or observations, that have been collected during an investigation. A conclusion is an explanation of what has been discovered using evidence collected.

Hinterland

Human growth charts are line graphs that show the predicted growth of juveniles and adolescents up to 18.

Y5 **Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.**

Skill

Core knowledge

- A conclusion is an explanation of what has been discovered using evidence collected.

Core knowledge

- Human growth charts are line graphs that show the predicted growth of juveniles and adolescents up to 18.

Broad knowledge

The results are information, such as measurements or observations, that have been collected during an investigation. A conclusion is an explanation of what has been discovered using evidence collected.

Hinterland

Human growth charts are line graphs that show the predicted growth of juveniles and adolescents up to 18.

Y5 **Identify scientific evidence that has been used to support or refute ideas or arguments.**

Skill

Core knowledge

- A conclusion is an explanation of what has been discovered using evidence collected.

Core knowledge

- Human growth charts are line graphs that show the predicted growth of juveniles and adolescents up to 18.

Broad knowledge

The results are information, such as measurements or observations, that have been collected during an investigation. A conclusion is an explanation of what has been discovered using evidence collected.

Hinterland

Human growth charts are line graphs that show the predicted growth of juveniles and adolescents up to 18.

Y5 **Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.**

Skill

Core knowledge

- Embryo, juvenile, adolescent and adult are stages of a mammal's life cycle.
- Egg, larva (tadpole), adolescent and adult are stages of an amphibian's life cycle..
- Egg, larva, pupa and adult are the stages of some insects including butterflies, beetles and bees.
- Egg, baby, adolescent and adult are stages of a bird's life cycle.

Core knowledge

- A life cycle is the series of changes in the life of a living thing and includes these basic stages: birth, growth, reproduction and death.

Core knowledge

- A mammal is a vertebrate, which means it has a backbone.
- Producing milk to feed their young, being warm blooded, giving birth to live young, having fur or hair and breathing air with lungs are the five key characteristics of mammals.

Core knowledge

- All mammalian life cycles have the same processes of birth, growth, puberty and reproduction as well as the same stages.
- The duration of each life cycle stage is different for different mammals.

Broad knowledge

A life cycle is the series of changes in the life of a living thing and includes these basic stages: birth, growth, reproduction and death. Mammals' life cycles include the stages: embryo, juvenile, adolescent and adult. Amphibians' life cycles include the stages: egg, larva (tadpole), adolescent and adult. Some insects' (butterflies, beetles and bees) life cycles include the stages: egg, larva, pupa and adult. Birds' life cycles include the stages: egg, baby, adolescent and adult.

Hinterland

Vocabulary used to describe stages of a life cycle include foetus, infant, juvenile, adolescent and adult. Vocabulary used to describe processes in a life cycle include birth, growth, puberty and reproduction.

Hinterland

A mammal is a vertebrate, which means it has a backbone. The five key mammalian characteristics of mammals are that they produce milk to feed their young, are warm blooded, give birth to live young, have fur or hair and breathe air with lungs.

Hinterland

The processes in mammalian life cycles are birth, growth, puberty and reproduction. The stages in mammalian life cycles are embryo, juvenile, adolescent and adult. The length of time for each stage and process varies between different mammals.

Y5 **Describe the life process of reproduction in some plants and animals.**

Skill

Core knowledge

- Humans reproduce sexually when a female egg is fertilised by a male sperm producing offspring that are different from the parents.

Broad knowledge

Humans reproduce sexually, which involves two parents (one female and one male) and produces offspring that are different from the parents.

Hinterland

During human sexual reproduction, a female egg is fertilised by a male sperm.

Skill

Core knowledge

- Sexual reproduction is the process of producing offspring and is essential for the continued survival of a species.
- Asexual reproduction involves one parent and produces offspring that is identical to the parent.

Broad knowledge

Reproduction is the process of producing offspring and is essential for the continued survival of a species. There are two types of reproduction: sexual and asexual. Sexual reproduction involves two parents (one female and one male) and produces offspring that are different from the parents. Asexual reproduction involves one parent and produces offspring that is identical to the parent.

Y5 **Describe the changes as humans develop to old age.**

Skill

Core knowledge

- Humans go through characteristic stages as they develop towards old age.
- Puberty is the transition between childhood and adulthood.
- As humans age, many of the body's systems gradually decline, leading to the changes seen in older people.

Core knowledge

- The human gestation period is around 40 weeks. During this time, the organs, limbs and senses develop, and the foetus grows until it is ready to be born.

Broad knowledge

Humans go through characteristic stages as they develop towards old age. These stages include baby, infant, toddler, child, adolescent, young adult, adult and senior citizen. Puberty is the transition between childhood and adulthood.

Hinterland

Gestation is the length of time the young of a mammal develops inside the female's body before birth. The human gestation period is around 40 weeks. During this time, the organs, limbs and senses develop, and the foetus grows until it is ready to be born.

Y5 **Develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics.**

Skill

Core knowledge

- Good personal hygiene (washing, wearing clean clothes and brushing teeth) can prevent disease or illness.

Broad knowledge

Good personal hygiene (washing, wearing clean clothes and brushing teeth) can prevent disease or illness. Puberty is the period during which adolescents reach sexual maturity and become capable of reproduction. It causes physical and emotional changes.

Properties and Changes of Materials

Hide

13 Programmes of study, 15 skills and 19 knowledge statements

Year 5 | Driver subject | Science | Changes | Gather & record data | Identify & classify | Investigation | Measurement | Observation | Properties and uses | Questioning | Report and conclude | Staying safe

Y5 **Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.**

Skill

Broad knowledge

A method is a set of clear instructions for how to carry out a scientific investigation. A prediction is a statement about what might happen in an investigation based on some prior knowledge or understanding.

Skill

Broad knowledge

Questions can help us find out about the world and can be answered using a range of scientific enquiries.

Y5 **Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.**

Skill

Broad knowledge

Specialised equipment is used to take measurements in standard units. Examples include data loggers plus sensors, such as light (lux), sound (dB) and temperature (°C); timers (seconds, minutes and hours); thermometers (°C), and measuring tapes (millimetres, centimetres, metres).

Hinterland

Line graphs show a relationship between two variables and usually show changes over time.

Skill

Core knowledge

- Accurate observations can be made repeatedly or at regular intervals to identify changes over time.

Broad knowledge

An observation involves looking closely at objects, materials and living things. Accurate observations can be made repeatedly or at regular intervals to identify changes over time.

Y5 **Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.**

Skill

Broad knowledge

Data can be recorded and displayed in different ways, including tables, bar and line charts, classification keys and labelled diagrams.

Hinterland

Different materials have different properties. Materials' properties makes them suitable for specific purposes.

Y5 **Use test results to make predictions to set up further comparative and fair tests.**

Skill

Core knowledge

- A conclusion is an explanation of what has been discovered using evidence collected.

Broad knowledge

The results are information, such as measurements or observations, that have been collected during an investigation. A conclusion is an explanation of what has been discovered using evidence collected.

Y5 **Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.**

Skill

Broad knowledge

The results are information, such as measurements or observations, that have been collected during an investigation. A conclusion is an explanation of what has been discovered using evidence collected.

Y5 **Identify scientific evidence that has been used to support or refute ideas or arguments.**

Skill

Core knowledge

- A conclusion is an explanation of what has been discovered using evidence collected.

Broad knowledge

The results are information, such as measurements or observations, that have been collected during an investigation. A conclusion is an explanation of what has been discovered using evidence collected.

Y5 **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.**

Skill

Core knowledge

- Materials can be grouped according to their basic physical properties.
- Properties of materials include: hardness, solubility, transparency, conductivity (electrical and thermal) and magnetism.

Core knowledge

- Thermal conductors, such as metals, are materials that allow the transfer of heat.
- Thermal conductors are useful for quickly heating things up.

- Thermal insulators, such as wood, glass and plastic, are materials that do not transfer heat effectively.
- Thermal insulators are useful for keeping things at the same temperature.

Broad knowledge

Materials can be grouped according to their basic physical properties. Properties include hardness, solubility, transparency, conductivity (electrical and thermal) and magnetism.

Hinterland

Thermal conductors conduct heat. Solid metals are good thermal conductors because their particles are closely packed and they have strong, lattice metallic bonds. Solids, such as plastic, wood and glass do not have these bonds so they do not conduct heat. They are thermal insulators. Liquids and gases are poor conductors of heat because their particles are further apart.

Y5 **Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.**

Skill

Core knowledge

- Dissolving is when a solute (material) becomes incorporated into a solvent (liquid) and can no longer be seen.
- Solubility is a measure of a material's ability to dissolve in a solvent.

Broad knowledge

Some materials (solutes) will dissolve in liquid (solvents) to form a solution. The solute can be recovered by evaporating off the solvent by heating.

Hinterland

Solubility is a measure of a material's ability to dissolve in a solvent. A material is soluble if it can dissolve in a solvent to form a solution. A material is insoluble if it cannot be dissolved in a solvent to form a solution. Dissolving is when a solute becomes incorporated into a solvent and can no longer be seen.

Y5 **Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.**

Skill

Core knowledge

- Sieving can be used to separate large solids from liquids and some solids from other solids.
- Filtering can be used to separate small solids from liquids.

Core knowledge 2

- A mixture is a combination of two or more substances that aren't chemically joined and can be separated back into their individual substances.
- Heterogeneous mixtures consist of distinctly different substances and are easy to separate by classifying and grouping or sieving or filtering.
- Substances in homogeneous mixtures are evenly distributed and you cannot see the different parts. Homogeneous substances are difficult to separate.

Broad knowledge

Some mixtures can be separated by filtering, sieving and evaporating. Sieving can be used to separate large solids from liquids and some solids from other solids. Filtering can be used to separate small solids from liquids. Evaporating can be used to separate dissolved solids from liquids.

Hinterland

A mixture is a combination of two or more substances that aren't chemically joined and can be separated back into their individual substances. Heterogeneous mixtures consist of distinctly different substances and are easy to separate. Substances in homogeneous mixtures are evenly distributed and you cannot see the different parts. Homogeneous mixtures are difficult to separate.

Hinterland

Filters separate solid particles from liquids or gases. Filters can be made from thin materials that contain tiny holes or layers of solid materials.

Y5 **Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.**

Skill

Core knowledge

- A material's properties dictate what it can be used for.

Broad knowledge

A material's properties dictate what it can be used for. For example, cooking pans are made from metal, which is a good thermal conductor, allowing heat to quickly transfer from the hob to the contents of the pan.

Y5 **Demonstrate that dissolving, mixing and changes of state are reversible changes.**

Skill

Core knowledge

- Reversible changes include heating, cooling, melting, dissolving and evaporating.
- Irreversible changes include burning, rusting, decaying and chemical reactions.

Core knowledge

- Irreversible changes are usually accompanied by one or more of these signs: a gas is produced; light is produced; a smell is produced or the smell changes; the colour changes; sound is produced, or the temperature changes.

Broad knowledge

Reversible changes include heating, cooling, melting, dissolving and evaporating. Irreversible changes include burning, rusting, decaying and chemical reactions.

Hinterland

Irreversible changes are usually accompanied by one or more of these signs: a gas is produced; light is produced; a smell is produced or the smell changes; the colour changes; sound is produced, or the temperature changes.

Y5 **Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.**

Skill

Core knowledge

- Reversible changes include heating, cooling, melting, dissolving and evaporating.
- Irreversible changes include burning, rusting, decaying and chemical reactions.

Core knowledge

- Irreversible changes are usually accompanied by one or more of these signs: a gas is produced; light is produced; a smell is produced or the smell changes; the colour changes; sound is produced, or the temperature changes.

Broad knowledge

Reversible changes include heating, cooling, melting, dissolving and evaporating. Irreversible changes include burning, rusting, decaying and chemical reactions.

Hinterland

Irreversible changes are usually accompanied by one or more of these signs: a gas is produced; light is produced; a smell is produced or the smell changes; the colour changes; sound is produced, or the temperature changes.

Y5 **Develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics.**

Skill

Core knowledge

- Very hot and very cold materials can burn skin.

Broad knowledge

Very hot and very cold materials can burn skin. Heating materials should be done safely.

Circulatory System

Hide

9 Programmes of study, 11 skills and 19 knowledge statements

Year 6 | Driver subject | Science | Gather & record data | Healthy lifestyle | Human body | Investigation | Measurement | Nutrition | Observation | Questioning | Report and conclude

Y6 **Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.**

Skill

Broad knowledge

A method is a set of clear instructions for how to carry out a scientific investigation, including what equipment to use and observations to make. A variable is something that can be changed during a fair test. A prediction is a statement about what might happen in an investigation based on some prior knowledge or understanding.

Hinterland

There are four main types of exercise: aerobic, strengthening, stretching and balancing. Exercise helps to keep the heart healthy and makes it stronger. The body needs more oxygen and nutrients during exercise, so the heart beats faster to pump more blood around the body. Fitter people usually have a lower heart rate and recover more quickly after exercise. Exercise benefits your heart by lowering blood pressure, reducing weight, strengthening muscles and lowering stress.

Skill

Core knowledge

- Questions can help us find out about the world and can be answered using a range of scientific enquiries, including fair tests, research and observation.

Broad knowledge

Questions can help us find out about the world and can be answered using a range of scientific enquiries, including fair tests, research and observation.

Y6 **Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.**

Skill

Core knowledge

- Resting heart rate is the number of times a heart beats per minute when a person is at rest.
- Heart rate increases during exercise because the body requires more oxygen to meet its needs.
- Heart rate can be measured by recording the pulse at different points of the body.
- A heart rate monitor can also be used to measure the pulse.

Broad knowledge

Specialised equipment is used to take accurate measurements in standard units. Examples include data loggers plus sensors, such as light (lux), sound (dB) and temperature (°C); timers (seconds, minutes and hours); thermometers (°C) and measuring tapes (millimetres, centimetres, metres).

Hinterland

The resting heart rate is the number of times a heart beats per minute when a person is at rest. The heart rate can be measured by recording the pulse at different points of the body. A heart rate monitor can also be used to measure the pulse.

Skill

Core knowledge

- Accurate observations can be made repeatedly or at regular intervals to identify changes over time, identify processes and make comparisons.

Broad knowledge

An observation involves looking closely at objects, materials and living things. Accurate observations can be made repeatedly or at regular intervals to identify changes over time, identify processes and make comparisons.

Y6 **Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.**

Skill

Core knowledge

- Data can be recorded and displayed in different ways, including tables, bar and line charts, scatter graphs, classification keys and labelled diagrams.

Broad knowledge

Data can be recorded and displayed in different ways, including tables, bar and line charts, scatter graphs, classification keys and labelled diagrams.

Hinterland

Athletes often have a lower resting heart rate than people who exercise less frequently. The fitter you are, the lower your resting heart rate. Fitter people tend to perform better at aerobic exercises, such as sprinting.

Y6 **Use test results to make predictions to set up further comparative and fair tests.**

Skill

Core knowledge

- A conclusion is an explanation of what has been discovered, using correct, precise terminology and collected evidence.

Broad knowledge

The results are information, such as measurements or observations, that have been collected during an investigation. A conclusion is an explanation of what has been discovered, using correct, precise terminology and collected evidence.

Y6 **Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.**

Skill

Core knowledge

- A conclusion is an explanation of what has been discovered, using correct, precise terminology and collected evidence.

Broad knowledge

The results are information, such as measurements or observations, that have been collected during an investigation. A conclusion is an explanation of what has been discovered, using correct, precise terminology and collected evidence.

Y6 **Identify scientific evidence that has been used to support or refute ideas or arguments.**

Skill

Core knowledge

- A conclusion is an explanation of what has been discovered, using correct, precise terminology and collected evidence.

Broad knowledge

The results are information, such as measurements or observations, that have been collected during an investigation. A conclusion is an explanation of what has been discovered, using correct, precise terminology and collected evidence.

Y6 **Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.**

Skill

Core knowledge

- The heart, blood and blood vessels make up the circulatory system.
- The circulatory system moves blood around the body.

Core knowledge

- The heart is a muscular organ that pumps blood around the body through the blood vessels.

Core knowledge

- Blood vessels are tubes inside the body.
- The three types of blood vessels are arteries, capillaries and veins.
- Arteries carry blood from the heart to the rest of the body.
- Capillaries connect arteries to veins. They allow oxygen and other nutrients to pass from the blood to the tissues, and carbon dioxide and other waste materials to pass from the tissues to the blood.
- Veins carry blood from around the body back to the heart.

Core knowledge

- Blood is a substance that carries oxygen, other nutrients and hormones around the body. It also carries carbon dioxide and other waste products so they can be excreted.
- Blood is made up of plasma, platelets, red blood cells and white blood cells.
- Plasma is a yellowish liquid, mainly water. It carries red blood cells, white blood cells and platelets around the body.
- Red blood cells carry oxygen and carbon dioxide around the body.
- White blood cells fight infection and other diseases.
- Platelets are small cell fragments that clump together to stop bleeding from a cut in a blood vessel.

Broad knowledge

The circulatory system includes the heart, blood vessels and blood. The heart pumps blood through the blood vessels and around the body. There are three types of blood vessel: arteries, veins and capillaries. They each have a different-sized hole (lumen) and walls. The blood carries gases (oxygen and carbon dioxide), water and nutrients to where they are needed. The

red blood cells carry oxygen and carbon dioxide around the body. The blood also contains white blood cells, which protect the body from infection.

Hinterland

The heart has four chambers: the right atrium, left atrium, right ventricle and left ventricle. Deoxygenated blood enters the right atrium from the body through the vena cava. It then passes through a valve and into the right ventricle. From there, it is pumped through a valve into the pulmonary artery. The artery carries the blood to the lungs, where it absorbs oxygen. The pulmonary veins carry oxygenated blood back from the lungs to the left atrium. The blood then passes through a valve to the left ventricle and is pumped out through the aorta to the rest of the body.

Hinterland

When the heart beats, the valves open to allow blood to flow in one direction. They then close completely to prevent any blood from leaking backwards. The septum divides the two sides of the heart and prevents the oxygenated and deoxygenated blood from mixing.

Hinterland

Arteries carry blood away from the heart, providing the tissues and organs with oxygen and other nutrients. They usually carry oxygenated blood. Veins carry blood back to the heart. They usually carry deoxygenated blood. They contain valves that prevent the blood from flowing backwards. Capillaries are tiny blood vessels that form a network and allow oxygen and other nutrients to pass from the blood into the tissues. They also allow waste products to pass into the blood to be excreted.

Hinterland

Blood is made up of four different components: plasma, platelets, red blood cells and white blood cells. Plasma is a yellowish liquid, mainly water but contains many essential proteins and salts. It carries red blood cells, white blood cells and platelets around the body. Platelets are small cell fragments that clump together to stop bleeding from a cut in a blood vessel. Blood has many functions, including supporting immunity, removing waste, clotting, transporting hormones and distributing heat.

Y6 **Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.**

Skill

Core knowledge

- Exercise benefits your heart by lowering blood pressure, reducing weight, strengthening muscles and lowering stress.

Core knowledge

- The Eatwell guide presents the foods and drinks that contribute to a healthy balanced diet.
- The five food groups are: fruit and vegetables, carbohydrates, dairy and alternatives, proteins and oils and spreads.
- Some foods, especially highly processed ones, are high in sugar, salt and fat are not necessary for a healthy, balanced diet.
- Eating more than the recommended daily amounts of saturated fat, sugar and salt can have a harmful effect on the circulatory system, such as causing high blood pressure and an increased risk of heart disease.
- Nutrition labels on pre-packaged food help us to know what is in the food we eat.
- Nutrition labels are often displayed using a traffic light system, so consumers can easily see whether the food contains high (red), medium (orange) or low (green) amounts of sugar, salt and saturated fat.

Core knowledge

- Smoking, drugs and alcohol can have a negative impact on the circulatory system.
- Smoking can result in cancer and heart disease.
- Alcohol can cause high blood pressure and increased stroke risk.
- Drugs can cause collapsed veins and cardiac arrest.

Broad knowledge

Lifestyle choices can have a positive (exercise and eating healthily) or negative (drugs, smoking and alcohol) impact on the body.

Hinterland

The Eatwell guide presents the foods and drinks that contribute to a healthy balanced diet. It shows you how much of the five food groups to eat. The food groups are fruit and vegetables, carbohydrates, dairy and alternatives, proteins and oils and spreads. Some foods, especially highly processed ones, are high in sugar, salt and fat. These are outside the Eatwell guide because they are not necessary for a healthy, balanced diet. Eating more than the recommended daily amounts of saturated fat, sugar and salt can have a harmful effect on the circulatory system, such as causing high blood pressure and an increased risk of heart disease. Nutrition labels on pre-packaged food help us to know what is in the food we eat. Nutrition labels are often displayed using a traffic light system, so consumers can easily see whether the food contains high (red), medium (orange) or low (green) amounts of sugar, salt and saturated fat.

Hinterland

Smoking, drugs and alcohol can have a negative impact on the circulatory system. For example, smoking can result in cancer and heart disease. Alcohol can cause high blood pressure and increased stroke risk. Drugs can cause collapsed veins and cardiac arrest.

Y6 **Describe the ways in which nutrients and water are transported within animals, including humans.**

Skill

Core knowledge

- The human body has different systems that support the seven life processes.
- The skeletal system supports movement, gives the body shape and protects the organs.
- The skeletal muscular system supports movement.
- The endocrine system supports growth.
- The nervous system supports sensation and movement as it controls almost everything the body does.
- The digestive system supports nutrition by breaking down food so the body can absorb nutrients.
- The excretory system supports excretion (getting rid of waste).

- The reproductive system supports reproduction.
- The respiratory system supports respiration by taking in oxygen when we breathe in and removing carbon dioxide when we breathe out.
- The circulatory system supports the transport of oxygen, water and nutrients around the body.

Broad knowledge

The role of the circulatory system is to transport oxygen, water and nutrients around the body. They are transported in blood and delivered to where they are needed.

Hinterland

The human body has different systems that support the seven life processes. The skeletal system supports movement, gives the body shape and protects the organs. The skeletal muscular system also supports movement. The endocrine system supports growth. It is made up of glands that produce hormones, which control growth and other processes. The nervous system supports sensation and movement as it controls almost everything the body does. The digestive system supports nutrition by breaking down food so the body can absorb nutrients. The excretory system supports excretion (getting rid of waste). The reproductive system supports reproduction. In sexual reproduction, the reproductive systems work together to produce offspring and continue the human life cycle. The respiratory system supports respiration by taking in oxygen when we breathe in and removing carbon dioxide when we breathe out.

Frozen Kingdoms

Hide

4 Programmes of study, 6 skills and 6 knowledge statements

Year 6 | Driver subject | Geography | Habitats | Identify & classify | Investigation | Questioning | Survival

Y6 **Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.**

Skill

Broad knowledge

A method is a set of clear instructions for how to carry out a scientific investigation, including what equipment to use and observations to make. A variable is something that can be changed during a fair test. A prediction is a statement about what might happen in an investigation based on some prior knowledge or understanding.

Skill

Core knowledge

- Questions can help us find out about the world and can be answered using a range of scientific enquiries, including fair tests, research and observation.

Broad knowledge

Questions can help us find out about the world and can be answered using a range of scientific enquiries, including fair tests, research and observation.

Y6 **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.**

Skill

Core knowledge

- Classification keys help us identify living things based on their physical characteristics.

Broad knowledge

Classification keys help us identify living things based on their physical characteristics.

Skill

Core knowledge

- The first and widest level in the biological classification system is called a kingdom, the second a phylum, then class, order, family, genus and species.
- There are five kingdoms: animals, plants, fungi, protists and monerans.
- Members of each kingdom have features in common.

Broad knowledge

Scientists classify living organisms into broad groups according to their characteristics. Vertebrates are an example of a classification group. There are a number of ranks, or levels, within the biological classification system. The first rank is called a kingdom, the second a phylum, then class, order, family, genus and species.

Y6 **Give reasons for classifying plants and animals based on specific characteristics.**

Skill

Core knowledge

- Living things are classified into groups, according to common observable characteristics and based on similarities and differences.

Broad knowledge

Living things are classified into groups, according to common observable characteristics and based on similarities and differences.

Y6 **Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.**

Skill

Core knowledge

- An adaptation is a physical or behavioural trait that allows a living thing to survive and fill an ecological niche.
- Natural selection is also known as 'survival of the fittest' because favourable traits help an organism survive and pass on their genes through reproduction.

Broad knowledge

An adaptation is a physical or behavioural trait that allows a living thing to survive and fill an ecological niche. Adaptations evolve by natural selection. Favourable traits help an organism survive and pass on their genes to subsequent generations.

Electrical Circuits and Components

Hide

9 Programmes of study, 11 skills and 12 knowledge statements

Year 6 | Driver subject | Science | Forces | Gather & record data | Investigation | Measurement | Modelling | Observation | Phenomena | Questioning | Report and conclude

Y6 **Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.**

Skill

Broad knowledge

A method is a set of clear instructions for how to carry out a scientific investigation, including what equipment to use and observations to make. A variable is something that can be changed during a fair test. A prediction is a statement about what might happen in an investigation based on some prior knowledge or understanding.

Skill

Core knowledge

- Questions can help us find out about the world and can be answered using a range of scientific enquiries, including fair tests, research and observation.

Broad knowledge

Questions can help us find out about the world and can be answered using a range of scientific enquiries, including fair tests, research and observation.

Y6 **Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.**

Skill

Broad knowledge

Specialised equipment is used to take accurate measurements in standard units. Examples include data loggers plus sensors, such as light (lux), sound (dB) and temperature (°C); timers (seconds, minutes and hours); thermometers (°C) and measuring tapes (millimetres, centimetres, metres).

Skill

Core knowledge

- Accurate observations can be made repeatedly or at regular intervals to identify changes over time, identify processes and make comparisons.

Broad knowledge

An observation involves looking closely at objects, materials and living things. Accurate observations can be made repeatedly or at regular intervals to identify changes over time, identify processes and make comparisons.

Y6 **Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.**

Skill

Core knowledge

- Data can be recorded and displayed in different ways, including tables, bar and line charts, scatter graphs, classification keys and labelled diagrams.

Broad knowledge

Data can be recorded and displayed in different ways, including tables, bar and line charts, scatter graphs, classification keys and labelled diagrams.

Hinterland

Electricity is a form of energy that makes things work. Circuit components include cells, buzzers, switches, wires, lamps and motors. A collection of components connected by wires in a loop is called a series circuit. Materials that allow electricity to flow through them are called electrical conductors. Materials that do not allow electricity to flow through them are called electrical insulators.

Y6 **Use test results to make predictions to set up further comparative and fair tests.**

Skill

Core knowledge

- Electric current is measured using an ammeter.
- The force that pushes electric charge around a circuit, called the voltage, is measured using a voltmeter.
- A multimeter measures both electric current and voltage.

Broad knowledge

The results are information, such as measurements or observations, that have been collected during an investigation. A conclusion is an explanation of what has been discovered, using correct, precise terminology and collected evidence.

Hinterland

An electric current is the flow of electric charge around a circuit. The electric current flows from the cell through all the components and back to the cell.

Hinterland

Electric current is measured using an ammeter. The force that pushes electric charge around a circuit, called the voltage, is measured using a voltmeter. A multimeter measures both electric current and voltage.

Y6 **Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.**

Skill

Core knowledge

- Electric current is measured using an ammeter.
- The force that pushes electric charge around a circuit, called the voltage, is measured using a voltmeter.
- A multimeter measures both electric current and voltage.

Broad knowledge

The results are information, such as measurements or observations, that have been collected during an investigation. A conclusion is an explanation of what has been discovered, using correct, precise terminology and collected evidence.

Hinterland

An electric current is the flow of electric charge around a circuit. The electric current flows from the cell through all the components and back to the cell.

Hinterland

Electric current is measured using an ammeter. The force that pushes electric charge around a circuit, called the voltage, is measured using a voltmeter. A multimeter measures both electric current and voltage.

Y6 **Identify scientific evidence that has been used to support or refute ideas or arguments.**

Skill

Core knowledge

- Electric current is measured using an ammeter.
- The force that pushes electric charge around a circuit, called the voltage, is measured using a voltmeter.
- A multimeter measures both electric current and voltage.

Broad knowledge

The results are information, such as measurements or observations, that have been collected during an investigation. A conclusion is an explanation of what has been discovered, using correct, precise terminology and collected evidence.

Hinterland

An electric current is the flow of electric charge around a circuit. The electric current flows from the cell through all the components and back to the cell.

Hinterland

Electric current is measured using an ammeter. The force that pushes electric charge around a circuit, called the voltage, is measured using a voltmeter. A multimeter measures both electric current and voltage.

Y6 **Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.**

Skill

Core knowledge

- Voltage is measured in volts (V).
- The bigger the voltage, the more electrons are pushed through the circuit.
- The more voltage flowing through a lamp, buzzer or motor, the brighter the lamp, the louder the buzzer and the faster the motor.

Broad knowledge

Voltage is measured in volts (V) and is a measure of the difference in electrical energy between two parts of a circuit. The bigger the voltage, the more electrons are pushed through the circuit. The more voltage flowing through a lamp, buzzer or motor, the brighter the lamp, the louder the buzzer and the faster the motor.

Y6 **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.**

Skill

Core knowledge

- A circuit needs a power source, such as a battery or cell, with wires connected to both the positive and negative terminals.
- An electric current is the flow of electric charge around a circuit. The electric current flows from the cell through all the components and back to the cell.
- When a switch is open, it creates a gap and the current cannot travel around the circuit.
- When a switch is closed, it completes the circuit and allows a current to flow all the way around it.

Broad knowledge

A circuit needs a power source, such as a battery or cell, with wires connected to both the positive and negative terminals. Other components include lamps, buzzers or motors, which an electric current passes through and affects a response, such as lighting a lamp or turning a motor. When a switch is open, it creates a gap and the current cannot travel around the circuit. When a switch is closed, it completes the circuit and allows a current to flow all the way around it.

Y6 **Use recognised symbols when representing a simple circuit in a diagram.**

Skill

Core knowledge

- Electrical symbols represent electrical components such as a switch, buzzer or lamp.

Broad knowledge

There are recognised symbols for different components of circuits.

Light Theory

12 Programmes of study, 16 skills and 18 knowledge statements

Hide

Year 6 | Driver subject | Science | Earth | Gather & record data | Investigation | Measurement | Observation | Pattern seeking | Phenomena | Properties and uses | Questioning | Report and conclude | Staying safe

Y6 **Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.**

Skill

Broad knowledge

A method is a set of clear instructions for how to carry out a scientific investigation, including what equipment to use and observations to make. A variable is something that can be changed during a fair test. A prediction is a statement about what might happen in an investigation based on some prior knowledge or understanding.

Skill

Core knowledge

- Questions can help us find out about the world and can be answered using a range of scientific enquiries, including fair tests, research and observation.

Broad knowledge

Questions can help us find out about the world and can be answered using a range of scientific enquiries, including fair tests, research and observation.

Hinterland

Light is a form of energy that travels as waves. Darkness is the absence of light. A light source produces light. Shiny, smooth and light-coloured materials reflect light; dull, rough and dark-coloured materials absorb light. The Sun creates day and night and shadows that move and change. Shadows form when light is blocked. Sunlight contains harmful ultraviolet rays.

Y6 **Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.**

Skill

Core knowledge

- Specialised equipment is used to take accurate measurements in standard units including light sensors measuring light intensity (lux).

Broad knowledge

Specialised equipment is used to take accurate measurements in standard units. Examples include data loggers plus sensors, such as light (lux), sound (dB) and temperature (°C); timers (seconds, minutes and hours); thermometers (°C) and measuring tapes (millimetres, centimetres, metres).

Skill

Core knowledge

- Accurate observations can be made repeatedly or at regular intervals to identify changes over time, identify processes and make comparisons.

Broad knowledge

An observation involves looking closely at objects, materials and living things. Accurate observations can be made repeatedly or at regular intervals to identify changes over time, identify processes and make comparisons.

Y6 **Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.**

Skill

Core knowledge

- Data can be recorded and displayed in different ways, including tables, bar and line charts, scatter graphs, classification keys and labelled diagrams.

Broad knowledge

Data can be recorded and displayed in different ways, including tables, bar and line charts, scatter graphs, classification keys and labelled diagrams.

Y6 **Use test results to make predictions to set up further comparative and fair tests.**

Skill

Core knowledge

- A conclusion is an explanation of what has been discovered, using correct, precise terminology and collected evidence.

Broad knowledge

The results are information, such as measurements or observations, that have been collected during an investigation. A conclusion is an explanation of what has been discovered, using correct, precise terminology and collected evidence.

Hinterland

Cones in the retina that are sensitive to red, green and blue light help us to see different colours. When different combinations of cones are stimulated, we see different colours.

Y6 **Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.**

Skill

Core knowledge

- A conclusion is an explanation of what has been discovered, using correct, precise terminology and collected evidence.

Broad knowledge

The results are information, such as measurements or observations, that have been collected during an investigation. A conclusion is an explanation of what has been discovered, using correct, precise terminology and collected evidence.

Hinterland

Cones in the retina that are sensitive to red, green and blue light help us to see different colours. When different combinations of cones are stimulated, we see different colours.

Y6 **Identify scientific evidence that has been used to support or refute ideas or arguments.**

Skill

Core knowledge

- A conclusion is an explanation of what has been discovered, using correct, precise terminology and collected evidence.

Broad knowledge

The results are information, such as measurements or observations, that have been collected during an investigation. A conclusion is an explanation of what has been discovered, using correct, precise terminology and collected evidence.

Hinterland

Cones in the retina that are sensitive to red, green and blue light help us to see different colours. When different combinations of cones are stimulated, we see different colours.

Y6 **Recognise that light appears to travel in straight lines.**

Skill

Core knowledge

- Light waves travel faster than sound waves.
- Light speed is nearly 300 million metres per second, the fastest thing in the universe.
- The light waves travels in a straight line from the light source to an object. Reflected light bounces off in a straight line at an angle equal to the angle of impact.
- Light waves in diagrams are drawn as straight lines with arrowheads that show the direction of travel.

Broad knowledge

Light travels in straight lines.

Hinterland

Light travels in waves in straight lines. Light waves in diagrams are drawn as straight lines with arrowheads that show the direction of travel. The angle at which light hits a reflective surface is the same angle at which it is reflected.

Y6 **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.**

Skill

Broad knowledge

Light sources give out light. They can be natural or artificial. When light hits an object, it is absorbed, scattered, reflected or a combination of all three. Light from a source or reflected light enter the eye. Vertebrates, such as mammals, birds and reptiles, have a cornea and lens that refracts light that enters the eye and focuses it on the nerve tissue at the back of the eye, which is called the retina. Once light reaches the retina, it is transmitted to the brain via the optic nerve.

Hinterland

The electromagnetic spectrum includes visible light that humans can see and light that humans cannot see. Visible light is made up of coloured light that when mixed makes white light.

Y6 **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.**

Skill

Broad knowledge

Light sources give out light. They can be natural or artificial. When light hits an object, it is absorbed, scattered, reflected or a combination of all three. Light from a source or reflected light enter the eye. Vertebrates, such as mammals, birds and reptiles, have a cornea and lens that refracts light that enters the eye and focuses it on the nerve tissue at the back of the eye, which is called the retina. Once light reaches the retina, it is transmitted to the brain via the optic nerve.

Hinterland

The electromagnetic spectrum includes visible light that humans can see and light that humans cannot see. Visible light is made up of coloured light that when mixed makes white light.

Y6 **Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.**

Skill

Core knowledge

- When a light source is close to an object, the shadow is large because the object is blocking more of the light coming from the source.
- As a light source moves further away from an object, the shadow gets smaller because the object blocks less light coming from the source.

Broad knowledge

A shadow appears when an object blocks the passage of light. Apart from some distortion or fuzziness at the edges, shadows are the same shape as the object. The distortion or fuzziness depends on the position or type of light source.

Y6 **Develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics.**

Skill

Core knowledge

- Lasers are intense beams of light and they should never be pointed at people's faces or aircraft.

Broad knowledge

Lasers are intense beams of light and they should never be pointed at people's faces or aircraft.

Skill

Core knowledge

- Shadows are formed when an object blocks the passage of light, leaving an area of darkness (the absence of light).

- Shadows move and change shape during the day as Earth rotates and the Sun appears in different positions in the sky.

Core knowledge

- Refraction is the bending of light as it passes from one transparent material to another.
- Refracted light creates a visible spectrum when white light shines through a prism or raindrops.

Broad knowledge

'White' light is a term used to describe visible, ordinary daylight. White light can be split into a spectrum of colours (rainbow) by droplets of water or prisms.

Hinterland

Refraction is the bending of light as it passes from one transparent material to another. Refracted light creates a visible spectrum when white light shines through a prism or raindrops. The human eye depends on refraction to see.

Skill

Core knowledge

- Light is a form of energy that travels as waves in straight lines.
- There are natural and artificial light sources.
- Light rays bounce off a reflector's surface, making it appear to light up.
- The Sun is the natural source of light and heat for Earth.
- Sunlight contains harmful ultraviolet (UV) rays. UVA rays age our skin and UVB rays cause sunburn. UV rays increase the risk of skin cancer.
- The Earth rotates on its axis once every 24 hours. When a part of the Earth rotates to face the Sun, the light creates daytime. When it rotates away from the Sun, the absence of light creates night time.

Y6 **Are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.**

Skill

Core knowledge

- Plane mirrors are flat, concave mirrors curve inwards and convex mirrors curve outwards.
- Plane mirror reflections are the same size, and the right way up but they are reversed.
- Concave mirrors enlarge the image and concentrate the rays of light into a focal point.
- Convex mirrors make images smaller and disperse light which reflects a wider view.

Broad knowledge

Mirrors and lenses are used in a range of everyday objects (telescopes, periscopes, cards and on roads). The human eye has a lens that bends and focuses light on the back of the eye (retina) so that we can see.

Hinterland

Plane mirrors are flat, concave mirrors curve inwards and convex mirrors curve outwards. Plane mirror reflections are the same size, and the right way up but they are reversed. Concave mirrors enlarge the image and concentrate the rays of light into a focal point. Convex mirrors make images smaller and disperse light which reflects a wider view.

Evolution and Inheritance

Hide

11 Programmes of study, 14 skills and 17 knowledge statements

Year 6 | Driver subject | Science | Changes | Gather & record data | Habitats | Identify & classify | Investigation | Living things | Measurement | Parts and functions | Questioning | Report and conclude | Survival

Y6 **Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.**

Skill

Broad knowledge

A method is a set of clear instructions for how to carry out a scientific investigation, including what equipment to use and observations to make. A variable is something that can be changed during a fair test. A prediction is a statement about what might happen in an investigation based on some prior knowledge or understanding.

Skill

Core knowledge

- Questions can help us find out about the world and can be answered using a range of scientific enquiries, including fair tests, research and observation.

Broad knowledge

Questions can help us find out about the world and can be answered using a range of scientific enquiries, including fair tests, research and observation.

Y6 **Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.**

Skill

Broad knowledge

Specialised equipment is used to take accurate measurements in standard units. Examples include data loggers plus sensors, such as light (lux), sound (dB) and temperature (°C); timers (seconds, minutes and hours); thermometers (°C) and measuring tapes (millimetres, centimetres, metres).

Y6 **Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.**

Skill

Core knowledge

- Data can be recorded and displayed in different ways, including tables, bar and line charts, scatter graphs, classification keys and labelled diagrams.

Broad knowledge

Data can be recorded and displayed in different ways, including tables, bar and line charts, scatter graphs, classification keys and labelled diagrams.

Y6 **Use test results to make predictions to set up further comparative and fair tests.**

Skill

Core knowledge

- A conclusion is an explanation of what has been discovered, using correct, precise terminology and collected evidence.

Broad knowledge

The results are information, such as measurements or observations, that have been collected during an investigation. A conclusion is an explanation of what has been discovered, using correct, precise terminology and collected evidence.

Y6 **Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.**

Skill

Core knowledge

- A conclusion is an explanation of what has been discovered, using correct, precise terminology and collected evidence.

Broad knowledge

The results are information, such as measurements or observations, that have been collected during an investigation. A conclusion is an explanation of what has been discovered, using correct, precise terminology and collected evidence.

Y6 **Identify scientific evidence that has been used to support or refute ideas or arguments.**

Skill

Core knowledge

- A conclusion is an explanation of what has been discovered, using correct, precise terminology and collected evidence.

Broad knowledge

The results are information, such as measurements or observations, that have been collected during an investigation. A conclusion is an explanation of what has been discovered, using correct, precise terminology and collected evidence.

Y6 **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.**

Skill

Core knowledge 2

- The first and widest level in the biological classification system is called a kingdom, the second a phylum, then class, order, family, genus and species.
- There are five kingdoms: animals, plants, fungi, protists and monerans.
- Members of each kingdom have features in common.

Broad knowledge

Scientists classify living organisms into broad groups according to their characteristics. Vertebrates are an example of a classification group. There are a number of ranks, or levels, within the biological classification system. The first rank is called a kingdom, the second a phylum, then class, order, family, genus and species.

Hinterland

There are five kingdoms: animals, plants, fungi, protists and monerans. Members of each kingdom have features in common. Microorganisms are microscopic living things found in the fungus, protista and monera kingdoms, and can be helpful or harmful to other living things. Viruses are not included in the kingdoms as they are not living and need a host to survive and reproduce.

Y6 **Give reasons for classifying plants and animals based on specific characteristics.**

Skill

Core knowledge

- Microorganisms are microscopic living things found in the fungus, protista and monera kingdoms.
- Microorganisms and can be helpful or harmful to other living things.
- Viruses are not included in the kingdoms as they are not living and need a host to survive and reproduce.

Broad knowledge

Living things are classified into groups, according to common observable characteristics and based on similarities and differences.

Y6 **Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.**

Skill

Core knowledge

- The theory of evolution was developed in the 19th century by the naturalists Charles Darwin and Alfred Russel Wallace.
- The theory states that: all life on Earth has evolved from simple life forms to more complex ones over time; all life on Earth has common ancestors and is therefore related, and; living things with characteristics most suited to their environment are more likely to survive and reproduce.

Core knowledge

- The fossil record and the DNA of living and extinct things provide evidence of evolution.

Broad knowledge

Scientists compare fossilised remains from the past to living species that exist today to hypothesise how living things have evolved over time. Humans and apes share a common ancestry and evidence for this comes from fossil discoveries and genetic comparison.

Hinterland

The theory of evolution was developed in the 19th century by the naturalists Charles Darwin and Alfred Russel Wallace. It states that: all life on Earth has evolved from simple life forms to more complex ones over time; all life on Earth has common ancestors and is therefore related, and; living things with characteristics most suited to their environment are more likely to survive and reproduce. The fossil record and the DNA of living and extinct things provide evidence of evolution. An evolutionary tree diagram shows the hypothetical evolutionary relationship between different living things over time.

Hinterland

Fossils are the remains or traces of once-living things preserved as rock and are over 10,000 years old. The fossil record is ordered from the oldest fossils to the newest fossils and provides a history of Earth. The fossil record is incomplete because soft-bodied animals decayed too quickly to be fossilised, and some fossils are still buried in the ground.

Skill

Y6 **Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents**

Skill

Core knowledge

- Inheritance is when living things pass on characteristics following sexual reproduction, such as height, skin colour and eye colour.
- Variation is the natural differences in characteristics between individuals of the same species.
- Continuous variation contains a range of values, such as the height or mass of different individuals of the same species.
- Discontinuous variation has a certain number of outcomes, such as eye colour and blood groups.

Broad knowledge

Animals that sexually reproduce generate new offspring of the same kind by combining the genetic material of two individuals. Each offspring inherits two of every gene, one from the female parent and one from the male parent.

Hinterland

Inheritance is when living things pass on characteristics following sexual reproduction, such as height, skin colour and eye colour. Variation is the natural differences in characteristics between individuals of the same species. There are two types of variation: continuous and discontinuous variation. Continuous variation contains a range of values, such as the height or mass of different individuals of the same species. Discontinuous variation has a certain number of outcomes, such as eye colour and blood groups.

Hinterland

Natural selection is the process behind the theory of evolution. Natural variation within a species may confer a positive, negative or negligible effect on the animal's ability to survive. If the variation has a positive effect, that individual is more likely to survive and pass the positive attribute to subsequent generations. Individuals with a negative characteristic are less likely to survive and reproduce. Natural selection is also known as 'survival of the fittest'.

Skill

Core knowledge

- Animals and plants can be bred to produce offspring with specific and desired characteristics. This is called selective breeding.

Broad knowledge

Animals and plants can be bred to produce offspring with specific and desired characteristics. This is called selective breeding. Examples include cows that produce large quantities of milk or crops that are disease-resistant.

Y6 **Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.**

Skill

Core knowledge

- An adaptation is a physical or behavioural trait that allows a living thing to survive and fill an ecological niche.
- Natural selection is also known as 'survival of the fittest' because favourable traits help an organism survive and pass on their genes through reproduction.

Core knowledge

- The three different types of plant adaptations are structural, behavioural and chemical.
- Structural adaptations include modified leaves, roots and trunks.
- Behavioural adaptations include movement towards the Sun and regulated growth.
- Chemical adaptations include the presence of stings and poisons.

Broad knowledge

An adaptation is a physical or behavioural trait that allows a living thing to survive and fill an ecological niche. Adaptations evolve by natural selection. Favourable traits help an organism survive and pass on their genes to subsequent generations.

Hinterland

There are three different types of plant adaptations: structural, behavioural and chemical. Structural adaptations include modified leaves, roots and trunks. Behavioural adaptations include movement towards the Sun and regulated growth. Chemical adaptations include the presence of stings and poisons.