Long Term Plan – Science (EYFS – Y6)

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| Curriculum 22/23 | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
| Nursery/Reception | Me and My Community  Exploring Autumn | Once Upon a Time  Sparkle & Shine | Starry Night  Winter Wonderland | Dangerous Dinosaurs  Puddles and Rainbows | Sunshine and Sunflowers  Shadows and Reflections | Big Wide World  Splash |
| Skills | * Begin to observe and talk about living things in the local environment. * Name a variety of domestic and wild animals. * Describe, predict and sort things that float and sink and talk about the forces that they can feel. * Explore the natural world around them and give simple descriptions, following observation, of changes. * Identify common features for different groups of animals, including wild and domestic animals. * With support, observe, record and talk about materials and living things. * A habitat is a place where living things live. Living things, including plants and animals, live in the local environment. * Animals are living things. There are lots of different types of animals. Pets are animals. * Many different animals live in a woodland, such as rabbits, badgers and foxes. * Some objects float and others sink. When an object sinks it falls through water to the bottom of the vessel. An object that floats stays at the water's surface. * Living things change over time. This includes growth and decay. * Some plants and trees change with the seasons. For example, new green leaves grow in the spring and some leaves change colour in autumn and fall from the trees. * Different animal groups have some common body parts, such as birds have wings and fish have fins. * Wild animals make their own homes including dens and burrows. They also have to hunt or gather their food. All animals have special features or ways of behaving that help them to survive. Some animals hibernate during the winter. Hibernation is a long period of sleep. | * Compare and group objects and materials according to simple given criteria. * Explore the natural world around them and give simple descriptions, following observation, of changes. * Identify that materials have different properties and explore and sort magnetic and non-magnetic materials through play and exploration. * With support, observe, record and talk about materials and living things. | * Begin to observe and talk about living things in the local environment. * Begin to talk about and name the body parts of common animals, including pets. * Make simple comparisons between objects and materials, such as bigger and smaller, and softer and harder. * Name a variety of domestic and wild animals. * Shows an interest in different occupations and the lives of familiar people. * Compare and group objects and materials according to simple given criteria. * Describe a contrasting environment to their own. * Describe, predict and sort things that float and sink and talk about the forces that they can feel. * Explore and describe electrical and non-electrical light sources. * Identify common features for different groups of animals, including wild and domestic animals. * Make a shadow bigger or smaller using toys, play equipment and a light source. * Represent scientific observations by mark making, drawing or creating simple charts and tables. Offer explanations for why things happen, making use of vocabulary, such as, because, then and next. * Talk about the different occupations that familiar adults and members of their community have. * With support, observe, record and talk about materials and living things. | * Identify common features for different groups of animals, including wild and domestic animals. * Make a shadow bigger or smaller using toys, play equipment and a light source. * Match animals to the foods that they eat. * Represent scientific observations by mark making, drawing or creating simple charts and tables. Offer explanations for why things happen, making use of vocabulary, such as, because, then and next. * With support, use simple equipment, such as timers, rulers and containers, to measure length, height, capacity and time. * Explore and talk about materials which are waterproof. * Say what the daily weather is like. * Describe simply how weather changes as the seasons change. * Describe some ways that plants or animals should be cared for in order for them to survive. * Explore and describe electrical and non-electrical light sources. * Name and describe natural phenomena, such as the size of shadows, the colours of a rainbow, the speed of clouds moving across the sky and the strength of a wave. * Record observations about the way the local environment changes throughout each season. * With support, observe, record and talk about materials and living things. | * Begin to observe and talk about living things in the local environment. * Care for growing seeds and plants and describe observable features of different types of plants and trees. * Begin to name and group plants and trees according to their observable features. * Describe some ways that plants or animals should be cared for in order for them to survive. * Explore the natural world around them and give simple descriptions, following observation, of changes. * Name and describe basic features of plants and trees. * Notice and begin to describe patterns of weather in summer and winter. * Observe and describe living things and their habitats within the local environment. * Represent scientific observations by mark making, drawing or creating simple charts and tables. Offer explanations for why things happen, making use of vocabulary, such as, because, then and next. * With support, observe, record and talk about materials and living things. | * Explore and talk about the ways that the weather, plants and animals of places can be different through pictures and stories. * Show care for living things and the environment. * Identify common features for different groups of animals, including wild and domestic animals. * Name and sort everyday items into groups of the same material. |
| Knowledge | * Objects can be compared and grouped according to their shape, colour, material or use. * Some materials are magnetic, which means that they are attracted to (pull towards) a magnet. Some metals are magnetic. Other materials are non-magnetic, such as wood, dough and glass. | * A habitat is a place where living things live. Living things, including plants and animals, live in the local environment. * The environment changes through the day and the year. * Animals have some similar and some different body parts. * Bats are nocturnal animals. * Nocturnal animals sleep in the day and are awake at night. * Animals are living things. There are lots of different types of animals. Pets are animals. * Objects can be compared and grouped according to their shape, colour, material or use. * Some objects float and others sink. When an object sinks it falls through water to the bottom of the vessel. An object that floats stays at the water's surface. * Some light sources need electricity or batteries to work, such as a torch, and some do not, such as candles. * Dark is the absence of light. * It is dark at night because that part of Earth is facing away from the Sun. * Different animal groups have some common body parts, such as birds have wings and fish have fins. * A shadow is the same shape as the object that makes it. Shadows change during the day. * Shadows are made when a solid object blocks a source of light. * The Moon can normally be seen in the night sky * The Moon orbits the Earth. * People have visited the Moon. * People travel into space in space shuttles. * An owl is a type of bird. * Most owls are nocturnal. * Owls have special features, such as large eyes, sharp talons and asymmetrical ears. * Nocturnal animals have special features that help them in the dark, such as excellent hearing or sense of smell. | * Living things like dinosaurs, plesiosaurs and pterosaurs lived millions of years ago. * A palaeontologist studies fossils of living things from the past. * Different animal groups have some common body parts, such as birds have wings and fish have fins. * A shadow is the same shape as the object that makes it. Shadows change during the day. * Animals eat different kinds of food, including other animals, plants or both animals and plants. * Carnivores are animals that eat other animals. * Herbivores are animals that eat plants. * Simple equipment can be used to measure distance, height, weight and time. * Different materials can be used for different things because they are hard, soft, bendy or waterproof. Waterproof items, such as Wellington boots, raincoats and umbrellas, protect us from the rain. * Ways to describe daily weather include sunny, rainy, windy, cloudy, warm or cold. Weather is warmer in the summer with more sunshine and colder in the winter with more snow, hail and rain. * Spring is one of the four seasons. You can get all types of weather in the spring. Different types of springtime weather include rain, sun, wind, hail, sleet and snow. * Plants and animals are living things. Plants need water, sunlight and air to survive. Animals need food, water, air and shelter to survive. * Some light sources need electricity or batteries to work, such as a torch, and some do not, such as candles. * Natural phenomena include weather, shadows, rainbows, clouds, flooding and waves. * Rain clouds are large collections of tiny water droplets. When the water droplets get too heavy, they fall to the earth as rain. * There are four seasons in the United Kingdom: spring, summer, autumn and winter. Each season has typical weather patterns. | * A habitat is a place where living things live. Living things, including plants and animals, live in the local environment. A habitat is a place where living things live. Local habitats include woodlands, gardens and ponds. Other habitats include hot places, such as deserts, and cold places, such as the Arctic. * The five senses are sight, hearing, touch, taste and smell. * Plants and trees are living things. * Plants need air, sunlight, warmth, water and nutrients from soil to grow. * Plants and trees are living things. They can be identified according to their features, such as leaves, seeds and flowers. * Parts of a plant include the roots, stem, leaves, flowers and petals. * Flowers are brightly coloured to attract insects. * Plants and animals are living things. Plants need water, sunlight and air to survive. Animals need food, water, air and shelter to survive. * Living things change over time. This includes growth and decay. * Parts of plants and trees include trunk, branch, twig, roots, stem, flowers and leaves. * A sunflower is a type of plant. * Parts of a plant include the roots, stem, leaves, flowers and petals. * Plants need air, sunlight, warmth, water and nutrients from soil to grow. * The weather can change throughout the day, week and month. The weather is different at different times in the year. * Plants draw up water through their roots. * Butterflies feed on nectar from flowers. * They suck the nectar through a long tongue called a proboscis, which they unroll. | * Climates and environments are different, depending on their location on Earth. * Different animal groups have some common body parts, such as birds have wings and fish have fins. * Objects are made from different materials. Everyday materials include, wood, plastic, glass, fabric, metal and stone. Materials have different properties. * Charles Darwin was a famous naturalist. * He lived from 1809–1882. * Charles Darwin was an expert in studying nature, plants, animals, rocks and fossils. |

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| Curriculum 22/23 | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
| Y1/2 | Uses of Materials | Plant Survival | Human Survival | Habitats | Animal Survival | |
| Skills | * Ask and answer scientific questions about the world around them. * Begin to notice patterns and relationships in their data and explain what they have done and found out using simple scientific language. * Compare the suitability of a range of everyday materials for particular uses, including wood, metal, plastic, glass, brick, rock, paper and cardboard . * Describe how some objects and materials can be changed and how these changes can be desirable or undesirable. * Follow a set of instructions to perform a range of simple tests, making simple predictions for what might happen and suggesting ways to answer their questions. * Observe objects, materials, living things and changes over time, sorting and grouping them based on their features and explaining their reasoning. * Use a range of methods (tables, charts, diagrams and Venn diagrams) to gather and record simple data with some accuracy. * Use simple equipment to measure and make observations. | * Ask and answer scientific questions about the world around them. * Begin to notice patterns and relationships in their data and explain what they have done and found out using simple scientific language. * Describe a range of local habitats and habitats beyond their locality (beaches, rainforests, deserts, oceans and mountains) and what all habitats provide for the things that live there. * Describe how plants need water, light and a suitable temperature to grow and stay healthy. * Follow a set of instructions to perform a range of simple tests, making simple predictions for what might happen and suggesting ways to answer their questions. * Identify and name a variety of plants and animals in a range of habitats and microhabitats. * Observe and describe how seeds and bulbs change over time as they grow into mature plants. * Observe objects, materials, living things and changes over time, sorting and grouping them based on their features and explaining their reasoning. * Use a range of methods (tables, charts, diagrams and Venn diagrams) to gather and record simple data with some accuracy. * Use simple equipment to measure and make observations.   + - Questions can help us find out about the world. | * Ask and answer scientific questions about the world around them. * Begin to notice patterns and relationships in their data and explain what they have done and found out using simple scientific language. * Describe the importance of a healthy lifestyle, including exercise, a balanced diet, good quality sleep and personal hygiene. * Describe the stages of human development (baby, toddler, child, teenager, adult and elderly). * Describe what humans need to survive. * Follow a set of instructions to perform a range of simple tests, making simple predictions for what might happen and suggesting ways to answer their questions. * Observe objects, materials, living things and changes over time, sorting and grouping them based on their features and explaining their reasoning. * Use a range of methods (tables, charts, diagrams and Venn diagrams) to gather and record simple data with some accuracy. * Use simple equipment to measure and make observations. | * Ask and answer scientific questions about the world around them. * Compare and group things that are living, dead or have never been alive. * Describe a range of local habitats and habitats beyond their locality (beaches, rainforests, deserts, oceans and mountains) and what all habitats provide for the things that live there. * Explain how animals, including humans, need water, food, air and shelter to survive. * Follow a set of instructions to perform a range of simple tests, making simple predictions for what might happen and suggesting ways to answer their questions. * Identify and name a variety of plants and animals in a range of habitats and microhabitats. * Interpret and construct simple food chains to describe how living things depend on each other as a source of food. * Observe objects, materials, living things and changes over time, sorting and grouping them based on their features and explaining their reasoning. * Use a range of methods (tables, charts, diagrams and Venn diagrams) to gather and record simple data with some accuracy. | * Ask and answer scientific questions about the world around them. * Begin to notice patterns and relationships in their data and explain what they have done and found out using simple scientific language. * Compare the suitability of a range of everyday materials for particular uses, including wood, metal, plastic, glass, brick, rock, paper and cardboard . * Describe a range of local habitats and habitats beyond their locality (beaches, rainforests, deserts, oceans and mountains) and what all habitats provide for the things that live there. * Describe the basic life cycles of some familiar animals (egg, caterpillar, pupa, butterfly; egg, chick, chicken; spawn, tadpole, froglet, frog). * Describe typical UK seasonal weather patterns. * Explain how animals, including humans, need water, food, air and shelter to survive. * Follow a set of instructions to perform a range of simple tests, making simple predictions for what might happen and suggesting ways to answer their questions. * Identify and name a variety of plants and animals in a range of habitats and microhabitats. * Interpret and construct simple food chains to describe how living things depend on each other as a source of food. * Observe objects, materials, living things and changes over time, sorting and grouping them based on their features and explaining their reasoning. * Use a range of methods (tables, charts, diagrams and Venn diagrams) to gather and record simple data with some accuracy. * Use simple equipment to measure and make observations. | |
| Knowledge | * Questions can help us find out about the world. * 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. * 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. * The results are information that has been found out from an investigation and can be used to answer a question. * 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. * 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. * Objects can be made from one material, more than one material or different materials with similar properties. * Some objects and materials can be changed by squashing, bending, twisting, stretching, heating, cooling, mixing and being left to decay. * 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. * Tests can be carried out by following a set of instructions. A prediction is a guess at what might happen in an investigation. * 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. * Objects, materials and living things can be looked at, compared and grouped according to their features. * Data can be recorded and displayed in different ways, including tables, charts, pictograms and drawings. * Simple equipment is used to take measurements and observations. Examples include timers, hand lenses, metre sticks and trundle wheels. | * Questions can help us find out about the world. * The results are information that has been found out from an investigation and can be used to answer a question. * 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. * Plants need water, light and a suitable temperature to grow and stay healthy. Without any one of these things, they will die. * Tests can be carried out by following a set of instructions. A prediction is a guess at what might happen in an investigation. * A habitat is a place where a living thing lives. A microhabitat is a very small habitat. * 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. * 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. * The flowers of plants produce seeds. Seeds also form inside cones. The flowers on some plants develop into fruit that contains seeds. * Objects, materials and living things can be looked at, compared and grouped according to their features. * 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. * Data can be recorded and displayed in different ways, including tables, charts, pictograms and drawings. * Simple equipment is used to take measurements and observations. Examples include timers, hand lenses, metre sticks and trundle wheels. | * Questions can help us find out about the world. * The results are information that has been found out from an investigation and can be used to answer a question. * 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. * 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. * 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. * Germs are microorganisms that can cause illness in humans. * Human offspring go through different stages as they grow to become adults. These include baby, toddler, child, teenager, adult and elderly. * 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. * A timeline is a linear diagram. A life cycle is a circular diagram. * Tests can be carried out by following a set of instructions. A prediction is a guess at what might happen in an investigation. * There are four types of exercise: aerobic, strengthening, stretching and balancing. * 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. * Germs spread from person to person through direct or indirect contact. * Objects, materials and living things can be looked at, compared and grouped according to their features. * Data can be recorded and displayed in different ways, including tables, charts, pictograms and drawings. * Simple equipment is used to take measurements and observations. Examples include timers, hand lenses, metre sticks and trundle wheels. | * Questions can help us find out about the world. * 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. * 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. * 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. * 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. * Animals need water, food, air and shelter to survive. Their habitat must provide all these things. * Tests can be carried out by following a set of instructions. A prediction is a guess at what might happen in an investigation. * 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. * A habitat is a place where a living thing lives. A microhabitat is a very small habitat. * 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. * 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.' * Objects, materials and living things can be looked at, compared and grouped according to their features. * 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. * Data can be recorded and displayed in different ways, including tables, charts, pictograms and drawings. * Animals eat food that is found in their habitat. Herbivores eat plants. Omnivores eat plants and animals. Carnivores eat animals. * Spotting sheets are used to identify unknown living things in a habitat. The physical characteristics of plants and animals can be compared with those on the spotting sheet for identification. * Animals eat food that is found in their habitat. Herbivores eat plants. Omnivores eat plants and animals. Carnivores eat animals. | * Questions can help us find out about the world. * The results are information that has been found out from an investigation and can be used to answer a question. * 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. * 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. * 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. * Animals have offspring that grow into adults. Different animals have different stages of growth or life cycles. * 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. * 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. * A life cycle can be drawn as a circular diagram. * 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. * Animals need water, food, air and shelter to survive. Their habitat must provide all these things. * 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. * Tests can be carried out by following a set of instructions. A prediction is a guess at what might happen in an investigation. * A habitat is a place where a living thing lives. A microhabitat is a very small habitat. * 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. * 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. * Objects, materials and living things can be looked at, compared and grouped according to their features. * Invertebrates are animals without a backbone. Invertebrates include worms, molluscs, crustaceans, insects, arachnids and myriapods. * Data can be recorded and displayed in different ways, including tables, charts, pictograms and drawings. * Simple equipment is used to take measurements and observations. Examples include timers, hand lenses, metre sticks and trundle wheels.   The life cycle stages of a darkling beetle include egg, mealworm (larva), pupa and adult darkling beetle. Mealworms undergo metamorphosis, completely changing from a larva to their adult form. | |

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| Curriculum 22/23 | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
| Y3/4 | Animal Nutrition and the Skeletal System | | Forces and Magnets | | Plant Nutrition and Reproduction | Light & Shadows |
| Skills | * Ask questions about the world around them and explain that they can be answered in different ways. * Compare and contrast the diets of different animals. * Describe how humans need the skeleton and muscles for support, protection and movement. * Explain the importance and characteristics of a healthy, balanced diet. * Gather and record findings in a variety of ways (diagrams, tables, charts and graphs) with increasing accuracy. * Identify and group animals that have no skeleton, an internal skeleton (endoskeleton) and an external skeleton (exoskeleton). * Make increasingly careful observations, identifying similarities, differences and changes and making simple connections. * Set up and carry out some simple, comparative and fair tests, making predictions for what might happen. * Use suitable vocabulary to talk or write about what they have done, what the purpose was and, with help, draw a simple conclusion based on evidence collected, beginning to identify next steps or improvements. Questions can help us find out about the world and can be answered in different ways. | | * Ask questions about the world around them and explain that they can be answered in different ways. * Compare and group materials based on their magnetic properties. * Compare how objects move over surfaces made from different materials. * Explain that an object will not move unless a push or pull force is applied, describing forces in action and whether the force requires direct contact or whether the force can act at a distance (magnetic force). * Gather and record findings in a variety of ways (diagrams, tables, charts and graphs) with increasing accuracy. * Investigate and compare a range of magnets (bar, horseshoe and floating) and explain that magnets have two poles (north and south) and that opposite poles attract each other, while like poles repel each other. * Make increasingly careful observations, identifying similarities, differences and changes and making simple connections. * Set up and carry out some simple, comparative and fair tests, making predictions for what might happen. * Take measurements in standard units, using a range of simple equipment. * Use suitable vocabulary to talk or write about what they have done, what the purpose was and, with help, draw a simple conclusion based on evidence collected, beginning to identify next steps or improvements. | | * Ask questions about the world around them and explain that they can be answered in different ways. * Describe the requirements of plants for life and growth (air, light, water, nutrients and room to grow) and how they vary from plant to plant. * Draw and label the life cycle of a flowering plant. * Gather and record findings in a variety of ways (diagrams, tables, charts and graphs) with increasing accuracy. * Investigate how water is transported within plants. * Make increasingly careful observations, identifying similarities, differences and changes and making simple connections. * Name and describe the functions of the different parts of flowering plants (roots, stem, leaves and flowers). * Set up and carry out some simple, comparative and fair tests, making predictions for what might happen. * Take measurements in standard units, using a range of simple equipment. * Use suitable vocabulary to talk or write about what they have done, what the purpose was and, with help, draw a simple conclusion based on evidence collected, beginning to identify next steps or improvements. | * Ask questions about the world around them and explain that they can be answered in different ways. * Describe the differences between dark and light and how we need light to be able to see. * Explain why light from the Sun can be dangerous. * Explain, using words or diagrams, how shadows are formed when a light source is blocked by an opaque object. * Find patterns in the way shadows change during the day. * Gather and record findings in a variety of ways (diagrams, tables, charts and graphs) with increasing accuracy. * Group and sort materials as being reflective or non-reflective. * Make increasingly careful observations, identifying similarities, differences and changes and making simple connections. * Set up and carry out some simple, comparative and fair tests, making predictions for what might happen. Take measurements in standard units, using a range of simple equipment. * Use suitable vocabulary to talk or write about what they have done, what the purpose was and, with help, draw a simple conclusion based on evidence collected, beginning to identify next steps or improvements. |
| Knowledge | * Questions can help us find out about the world and can be answered in different ways. * 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. * 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. * 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. * 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. * 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. * 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. * 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. * 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. * 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. * 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. * 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. * 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. * An observation involves looking closely at objects, materials and living things, which can be compared and grouped according to their features. * 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. * 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. * 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. | | * Questions can help us find out about the world and can be answered in different ways. * 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. * Iron, cobalt, nickel and steel are magnetic metals. * 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. * 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. * Forces act in pairs that oppose each other. Forces cause objects to move, change speed or change shape. * 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. * 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. * 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. * Magnetism is a non-contact force. * There are different types of magnets, such as horseshoe magnets, magnetic marbles, wand magnets and floating magnets. Magnets have different strengths. * An observation involves looking closely at objects, materials and living things, which can be compared and grouped according to their features. * 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. * 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. * 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. * 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). * 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. * 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. * A navigational compass needle is magnetic and always points north. | | * Questions can help us find out about the world and can be answered in different ways. * 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. * 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. * 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). * A life cycle is a series of changes that happen to a living thing during its lifetime. All plants have a life cycle. * 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. * Water is transported in plants from the roots, through the stem and to the leaves, through tiny tubes called xylem. * 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. * 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. * An observation involves looking closely at objects, materials and living things, which can be compared and grouped according to their features. * 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. * 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. * 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. * Seed dispersal is the movement of seeds away from the parent plant. * 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. * 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. * 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. * 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. | * Questions can help us find out about the world and can be answered in different ways. * Dark is the absence of light and we need light to be able to see. * Light is a form of energy that travels in straight lines. * 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. * Opaque objects cast dark shadows. Translucent objects cast lighter, blurry shadows. * Shadows change when the light source or the object moves. For example, when a light source is lowered, shadows grow longer. * 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. * 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. * 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. * 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. * An observation involves looking closely at objects, materials and living things, which can be compared and grouped according to their features. * 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. * 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. * 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. * 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. |

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| Curriculum 22/23 | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
| Y5 | Human Reproduction and Ageing | | Earth and Space | Forces and Mechanisms | Properties and Changes of Materials | |
| Skills | * Ask a wide range of relevant scientific questions that broaden their understanding of the world around them and identify how they can answer them. * Compare the life cycles of animals, including a mammal, an amphibian, an insect and a bird. * Describe the changes as humans develop from birth to old age. * Describe the life process of reproduction in some plants and animals. * Describe the process of human reproduction. * Explain why personal hygiene is important during puberty. * Gather and record data and results of increasing complexity, selecting from a range of methods (scientific diagrams, labels, classification keys, tables, graphs and models). * Plan and carry out a range of enquiries, including writing methods, identifying variables and making predictions based on prior knowledge and understanding. * Take increasingly accurate measurements in standard units, using a range of chosen equipment. * Use relevant scientific vocabulary to report on their findings, answer questions and justify their conclusions based on evidence collected, identify improvements, further questions and predictions. * Within a group, decide which observations to make, when and for how long, and make systematic and careful observations, using them to make comparisons, identify changes, classify and make links between cause and effect. | | * Ask a wide range of relevant scientific questions that broaden their understanding of the world around them and identify how they can answer them. * Describe or model the movement of the Moon relative to Earth. * Describe or model the movement of the planets in our Solar System, including Earth, relative to the Sun. * Describe the Sun, Earth and Moon as approximately spherical bodies and use this knowledge to understand the phases of the Moon and eclipses. * Use relevant scientific vocabulary to report on their findings, answer questions and justify their conclusions based on evidence collected, identify improvements, further questions and predictions. * Use the idea of Earth's rotation to explain day and night, and the Sun's apparent movement across the sky. | * Ask a wide range of relevant scientific questions that broaden their understanding of the world around them and identify how they can answer them. * Compare and describe, using a range of toys, models and natural objects, the effects of water resistance, air resistance and friction. * Describe and demonstrate how simple levers, gears and pulleys assist the movement of objects. * Explain that objects fall to Earth due to the force of gravity. * Gather and record data and results of increasing complexity, selecting from a range of methods (scientific diagrams, labels, classification keys, tables, graphs and models). * Plan and carry out a range of enquiries, including writing methods, identifying variables and making predictions based on prior knowledge and understanding. * Take increasingly accurate measurements in standard units, using a range of chosen equipment. * Use relevant scientific vocabulary to report on their findings, answer questions and justify their conclusions based on evidence collected, identify improvements, further questions and predictions. * Within a group, decide which observations to make, when and for how long, and make systematic and careful observations, using them to make comparisons, identify changes, classify and make links between cause and effect. | * Ask a wide range of relevant scientific questions that broaden their understanding of the world around them and identify how they can answer them. * Compare and group everyday materials by their properties, including hardness, solubility, transparency, conductivity (electrical and thermal) and magnetism. * Describe, using evidence from comparative or fair tests, why a material has been chosen for a specific use, including metals, wood and glass. * Explain the precautions needed for working safely when heating, burning, cooling and mixing materials. * Explain, following observation, that some substances (solutes) will dissolve in liquid (solvents) to form a solution and the solute can be recovered by evaporating off the solvent. * Gather and record data and results of increasing complexity, selecting from a range of methods (scientific diagrams, labels, classification keys, tables, graphs and models). * Identify, demonstrate and compare reversible and irreversible changes. * Plan and carry out a range of enquiries, including writing methods, identifying variables and making predictions based on prior knowledge and understanding. * Separate mixtures by filtering, sieving and evaporating. * Take increasingly accurate measurements in standard units, using a range of chosen equipment. * Use relevant scientific vocabulary to report on their findings, answer questions and justify their conclusions based on evidence collected, identify improvements, further questions and predictions. * Within a group, decide which observations to make, when and for how long, and make systematic and careful observations, using them to make comparisons, identify changes, classify and make links between cause and effect. | |
| Knowledge | * Questions can help us find out about the world and can be answered using a range of scientific enquiries. * 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. * 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. * 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. * 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. * 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. * 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. * 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. * 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. * Humans reproduce sexually, which involves two parents (one female and one male) and produces offspring that are different from the parents. * During human sexual reproduction, a female egg is fertilised by a male sperm. * 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. * Data can be recorded and displayed in different ways, including tables, bar and line charts, classification keys and labelled diagrams. * 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. * In general, mammals with a smaller mass have a shorter gestation period, and mammals with a larger mass have a longer gestation period. * Humans are mammals and have a mammalian life cycle. * 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. * 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. * 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). * 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. * Human growth charts are line graphs that show the predicted growth of juveniles and adolescents up to 18. * 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. | | * Questions can help us find out about the world and can be answered using a range of scientific enquiries. * The Moon orbits Earth, completing a full orbit every month (27.3 days). * 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. * 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. * 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. * 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. * 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. * 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. * 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. * 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. * 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. * 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. * 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. * 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. | * Questions can help us find out about the world and can be answered using a range of scientific enquiries. * 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. * 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. * 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. * Increasing air resistance makes an object fall to Earth more slowly. * 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. * 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. * 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. * 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. * 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. * 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. * 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. * Gravity is a non-contact, pulling force which attracts two objects that have mass. * Data can be recorded and displayed in different ways, including tables, bar and line charts, classification keys and labelled diagrams. * 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. * 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). * A force meter can be used to measure an object's mass in grams (g) or kilograms (kg) and its weight in newtons (N). * A line graph can be used to show the correlation between an object's mass and its weight. * 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. * 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. * 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. | * Questions can help us find out about the world and can be answered using a range of scientific enquiries. * Materials can be grouped according to their basic physical properties. Properties include hardness, solubility, transparency, conductivity (electrical and thermal) and magnetism. * 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. * 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. * Very hot and very cold materials can burn skin. Heating materials should be done safely. * Some materials (solutes) will dissolve in liquid (solvents) to form a solution. The solute can be recovered by evaporating off the solvent by heating. * 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. * Data can be recorded and displayed in different ways, including tables, bar and line charts, classification keys and labelled diagrams. * Different materials have different properties. Materials' properties makes them suitable for specific purposes. * Reversible changes include heating, cooling, melting, dissolving and evaporating. Irreversible changes include burning, rusting, decaying and chemical reactions. * 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. * 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. * 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. * 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. * Filters separate solid particles from liquids or gases. Filters can be made from thin materials that contain tiny holes or layers of solid materials. * 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). * Line graphs show a relationship between two variables and usually show changes over time. * 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. * 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. | |