Pippins Primary School Curriculum Overview

Subject: Science

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1	**Topic:** Everyday Materials	**Topic:** Human Senses	**Topic:** Seasonal Changes		**Topic:** Plant parts	**Topic:** Animal Parts
	Concept: Properties of Materials	**Concept:** Human Body	**Concept:** Seasons		**Concept:** Living things	**Concept:** Living things
	Skills and Knowledge: Ask simple scientific questions. Question words include what, why, how, when, who and which. With support, use simple equipment to measure and make observations. Simple equipment is used to take measurements and observations. With support, follow instructions to perform simple tests and begin to talk about what they might do or what might happen. Simple tests can be carried out by	**Skills and Knowledge:** Observe objects, materials, living things and changes over time, sorting and grouping them based on their features. Objects, materials and living things can be looked at and compared. Talk about what they have done and say, with help, what they think they have found out. The results are information that has been found out from an investigation. Observe the local environment throughout the year and ask and answer questions about living	**Skills and Knowledge:** Recall and know about the four seasons. Go out into the local environment to experience the weather. Examine the difference between deciduous and evergreen trees, observing trees in the local environment. Understand how the seasons affect animals and make comparisons between them. Find out what the weather is, what types of weather there are and what causes the weather. Understand what the weather is like in each season and discover why the lengths of daytime and night time change in different seasons. Learn about the Sun and how to protect our skin from the Sun's rays. Observe and measure the wind, recording data on a bar chart. Read the temperature from a thermometer and record temperatures over a series of days.		**Skills and Knowledge:** With support, use simple equipment to measure and make observations. Talk about what they have done and say, with help, what they think they have found out. The results are information that has been found out from an investigation. Identify, compare, group and sort a variety of common wild and garden plants, including deciduous and evergreen trees, based on observable features. Plants are living things. Common plants include the daisy, daffodil and	**Skills and Knowledge:** With support, gather and record simple data in a range of ways (data tables, diagrams, Venn diagrams). Data can be recorded and displayed in different ways, including tables, pictograms and drawings. Identify, compare, group and sort a variety of common animals, including fish, amphibians, reptiles, birds, invertebrates and mammals, based on observable features. Animals are living things. Animals can be sorted and grouped into six main groups: fish, amphibians, reptiles,

	following a set of instructions. Identify and name what an object is made from, including wood, plastic, glass, metal, water and rock. A material is what an object is made from. Everyday materials include wood, plastic, glass, metal, water, rock, brick, paper and fabric. Identify and name what an object is made from, including wood, plastic, glass, metal, water and rock. Investigate and describe the simple physical properties of some everyday materials, such as hard or soft; stretchy or stiff; rough or smooth; opaque or transparent; bendy or rigid and waterproof or not waterproof. Materials have different properties, such as hard or soft; stretchy or stiff; rough	things and seasonal change. With support, gather and record simple data in a range of ways (data tables, diagrams, Venn diagrams). Data can be recorded and displayed in different ways, including tables, pictograms and drawings. Identify, compare, group and sort a variety of common animals, including fish, amphibians, reptiles, birds, invertebrates and mammals, based on observable features. Know animals are living things. Animals can be sorted and grouped into six main groups: fish, amphibians, reptiles, birds, invertebrates and mammals. Label and describe the basic structures of a variety of common animals, including fish, amphibians, reptiles, birds and mammals.	Measure rainfall and carry out an investigation into the rain. Know about weather forecasts and symbols.	grass. Trees are large, woody plants and are either evergreen or deciduous Label and describe the basic structure of a variety of common plants. Describe ways to stay safe in some familiar situations. Describe how to care for plants and animals, including pets. Understand living things need to be cared for in order for them to survive. They need water, food, warmth and shelter. Describe, following observation, how plants and animals change over time. All living things (plants and animals) change over time as they grow and mature. Investigate weather using toys, models or simple equipment. Simple equipment can be used for measuring weather, such as	birds, invertebrates and mammals. Group and sort a variety of common animals based on the foods they eat. Know that carnivores eat other animals (meat), herbivores eat plants and omnivores eat other animals and plants. Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). Describe ways to stay safe in some familiar situations. Describe how to care for plants and animals, including pets. Living things need to be cared for in order for them to survive. They need water, food, warmth and shelter.

	or smooth; opaque or transparent; bendy or rigid; waterproof or not waterproof. Compare and group materials in a variety of ways, such as based on their physical properties; being natural or human-made and being recyclable or non-recyclable. Materials can be grouped according to their properties.	Understand different animal groups have some common body parts, such as eyes and a mouth, and some different body parts, such as fins or wings. Draw and label the main parts of the human body and say which body part is associated with which sense. It is important to stay safe. Some ways to stay safe include staying safe in strong sunlight), crossing roads), in the kitchen and with household chemicals		measuring temperature with a thermometer; identifying wind direction and force with a windsock or measuring rainfall with a rain gauge.	
	Outcome: Know that objects are made from materials. Identify a range of everyday materials and their sources. Investigate the properties of materials and begin to recognise that a material's properties define its use.	**Outcome:** Know humans are a type of animal known as a mammal. Name and count body parts and identify similarities and differences. Learn about the senses, the body parts associated with each sense and their role in keeping us safe.	**Outcome:** Know the seasons, seasonal changes and typical seasonal weather and events. Measure the weather and understand the role of a meteorologist. Children begin to learn about the science of day and night and recognise that the seasons have varying day lengths in the UK.	**Outcome:** Know about wild and garden plants by exploring the local environment. Identify and describe the basic parts of plants and observe how they change over time.	**Outcome:** Know about animals, including fish, amphibians, reptiles, birds, mammals and invertebrates. Identify and describe their common structures, diets, and how animals should be cared for**.**

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 2	**Topic:** Human Survival	**Topic:** Habitats	**Topic:** Uses of materials	**Topic:** Plant survival	**Topic:** Animal Survival	**Topic:** Animal Survival
	Concept:	**Concept:**	**Concept:**	**Concept:**	**Concept:**	**Concept:**
	Skills and Knowledge: 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. The local environment is a habitat for living things and can change during the seasons. Begin to notice patterns and relationships in their data and explain what they have done and found out using simple scientific language. The results are information that has been found out from an investigation and can be used to answer a question. Use a range of methods (tables,	**Skills and Knowledge:** Ask and answer scientific questions about the world around them. Know that objects, materials and living things can be looked at, compared and grouped according to their features. Compare and group things that are living, dead or have never been alive. Living things are those that are alive. Dead things are those that were once living but are no longer. . 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.	**Skills and Knowledge:** Use simple equipment to measure and make observations. Simple equipment is used to take measurements and observations. Examples include timers, hand lenses, metre sticks and trundle wheels. Compare the suitability of a range of everyday materials for particular uses, including wood, metal, plastic, glass, brick, rock, paper and cardboard. 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.	**Skills and Knowledge:** Begin to notice patterns and relationships in their data and explain what they have done and found out using simple scientific language. The results are information that has been found out from an investigation and can be used to answer a question. 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. All living things live in a habitat to which they are suited and it must provide everything they need to survive. Identify and name a variety of plants and	**Skills and Knowledge:** Ask and answer scientific questions about the world around them. Questions can help us find out about the world. Begin to notice patterns and relationships in their data and explain what they have done and found out using simple scientific language. The results are information that has been found out from an investigation and can be used to answer a question. Use a range of methods (tables, charts, diagrams and Venn diagrams) to gather and record simple data with some accuracy. Data can be recorded and displayed in different ways, including tables, charts, pictograms and drawings. Make models with moving parts. Models can have moving parts that use levers, sliders, wheels and axles. Describe typical UK seasonal weather patterns. 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. 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. 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	

	charts, diagrams and Venn diagrams) to gather and record simple data with some accuracy. Data can be recorded and displayed in different ways, including tables, charts, pictograms and drawings. Describe the stages of human development (baby, toddler, child, teenager, adult and elderly). Human offspring go through different stages as they grow to become adults. These include baby, toddler, child, teenager, adult and elderly. Describe the basic life cycles of some familiar animals (egg, caterpillar, pupa, butterfly; egg, chick, chicken; spawn, tadpole, froglet, frog). Animals have offspring that grow into adults.	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. Identify and name a variety of plants and animals in a range of habitats and microhabitats. A habitat is a place where a living thing lives. A microhabitat is a very small habitat. Interpret and construct simple food chains to describe how living things depend on each other as a source of food. Food chains show how living things depend on one another for food. All food chains start with a plant, followed by animals that either	Describe how some objects and materials can be changed and how these changes can be desirable or undesirable. Some objects and materials can be changed by squashing, bending, twisting, stretching, heating, cooling, mixing and being left to decay.	animals in a range of habitats and microhabitats. Observe and describe how seeds and bulbs change over time as they grow into mature plants. 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. Describe how plants need water, light and a suitable temperature to grow and stay healthy. Plants need water, light and a suitable temperature to grow and stay healthy. Without any one of these things, they will die.	which they are suited and it must provide everything they need to survive. Identify and name a variety of plants and animals in a range of habitats and microhabitats. A habitat is a place where a living thing lives. A microhabitat is a very small habitat. Interpret and construct simple food chains to describe how living things depend on each other as a source of food. 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. Describe the stages of human development (baby, toddler, child, teenager, adult and elderly). Human offspring go through different stages as they grow to become adults. These include baby, toddler, child, teenager, adult and elderly. Describe the basic life cycles of some familiar animals (egg, caterpillar, pupa, butterfly; egg, chick, chicken; spawn, tadpole, froglet, frog). Animals have offspring that grow into adults. Different animals have different stages of growth or life cycles. Describe what humans need to survive. Humans need water, food, air and shelter to survive. Explain how animals, including humans, need water, food, air and shelter to survive. Animals need water, food, air and shelter to survive. Their habitat must provide all these things.

	Different animals have different stages of growth or life cycles. Describe the importance of a healthy lifestyle, including exercise, a balanced diet, good quality sleep and personal hygiene.	eat the plant or other animals. Describe what humans need to survive. Humans need water, food, air and shelter to survive. Explain how animals, including humans, need water, food, air and shelter to survive.			
	Outcomes: Know the basic needs of humans for survival, including the importance of exercise, nutrition and good hygiene. Learn how human offspring grow and change over time into adulthood.	**Outcomes:** Learn about habitats and what a habitat needs to provide. Explore local habitats to identify and name living things and begin to understand how they depend on one another for food and shelter.	**Outcomes:** Know the uses of everyday materials and how materials' properties make them suitable or unsuitable for specific purposes. They begin to explore how materials can be changed.	**Outcomes:** Learn about the growth of plants from seeds and bulbs. Observe the growth of plants first hand, recording changes over time and identifying what plants need to grow and stay healthy.	**Outcomes:** Know about growth in animals by exploring the life cycles of some familiar animals. Build on learning about the survival of humans by identifying the basic needs of animals for survival, including food, water, air and shelter.

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 3	**Topic:** Animal Nutrition and the Skeletal System		**Topic:** Forces and Magnets		**Topic:** Plant Nutrition and Reproduction	**Topic:** Light and Shadows
	Concept: Anatomy		**Concept:** Forces		**Concept:**	**Concept:** Light
	Skills and Knowledge Begin to independently plan, set up and carry out a range of comparative and fair tests, making predictions and following a method accurately. 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. Describe how humans need the skeleton and muscles for support, protection and movement. 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. Identify and group animals that have no skeleton, an internal skeleton (endoskeleton) and an external skeleton (exoskeleton). 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		**Skills and Knowledge** Ask questions about the world around them and explain that they can be answered in different ways. 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. Questions can help us find out about the world and can be answered in different ways. Set up and carry out some simple, comparative and fair tests, making predictions for what might happen. 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. Make increasingly careful observations, identifying similarities, differences and changes and making simple connections. An observation involves looking closely at objects, materials and living things, which can be compared and grouped according to their features. Compare and group materials based on their magnetic properties. 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.		**Skills and Knowledge** Begin to choose which observations to make and for how long and make systematic, careful observations and comparisons, identifying changes and connections. An observation involves looking closely at objects, materials and living things. Observations can be made regularly to identify changes over time. Name and describe the functions of the different parts of flowering plants (roots, stem, leaves and flowers). 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) supports the plant above the ground. The leaves	**Skills and Knowledge** Set up and carry out some simple, comparative and fair tests, making predictions for what might happen. 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. Begin to independently plan, set up and carry out a range of comparative and fair tests, making predictions and following a method accurately. Describe the differences between dark and light and how we need light to be able to see. Dark is the absence of light and we need light to be able to see.

	beetles and flies. Some animals have no skeleton, such as slugs and jellyfish. Ask relevant scientific questions, independently, about the world around them and begin to identify how they can answer them.	Compare and group materials based on their magnetic properties. 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. 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. 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. 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. 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. 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). 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. Compare how objects move over surfaces made from different materials. 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.	collect energy from the Sun and make food for the plant. Flowers make seeds to produce new plants. 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. 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. Investigate how water is transported within plants. Water is transported in plants from the roots, through the stem and to the leaves, through tiny tubes called xylem. Draw and label the life cycle of a flowering plant. Flowers are important in the life cycle of flowering plants. The processes of a plant's	Group and sort materials as being reflective or non-reflective. 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. Explain why light from the Sun can be dangerous. 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. Explain, using words or diagrams, how shadows are formed when a light source is blocked by an opaque object. 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.

			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).	Find patterns in the way shadows change during the day. 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.
	Outcomes: Know the importance of nutrition for humans and other animals. Know the role of a skeleton and muscles and identify animals with different types of skeleton.	**Outcomes:** Learn about contact and non-contact forces, including friction and magnetism. Investigate frictional and magnetic forces, and identify parts of a magnet and magnetic materials.	**Outcomes:** This project teaches children about the requirements of plants for growth and survival. They describe the parts of flowering plants and relate structure to function, including the roots and stem for transporting water, leaves for making food and the flower for reproduction.	**Outcomes:** This project teaches children about light and dark. They investigate the phenomena of reflections and shadows, looking for patterns in collected data. The risks associated with the Sun are also explored.

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 4	**Topic:** Food and the Digestive System	**Topic:** Sound	**Topic:** States of matter	**Topic:** Grouping and classifying	**Topic:** Electrical circuits and conductors	**Topic:** Electrical circuits and conductors
	Concept: Human anatomy	**Concept:** Sound	**Concept:** States of matter	**Concept:** Grouping and classifying	**Concept:** Electricity	**Concept:** Electricity
	Skills and Knowledge Describe the purpose of the digestive system, its main parts and each of their functions. Identify the four different types of teeth in humans and other animals, and describe their functions. Ask relevant scientific questions, independently, about the world around them and begin to identify how they can answer them. Construct and interpret a variety of food chains and webs to show interdependence and how energy is passed on over time.	**Skills and Knowledge** Ask relevant scientific questions, independently, about the world around them and begin to identify how they can answer them. Begin to independently plan, set up and carry out a range of comparative and fair tests, making predictions and following a method accurately. Explain how sounds are made and heard using diagrams, models, written methods or verbally. Compare and find patterns in the volume of a sound, using a range of equipment, such as musical instruments.	**Skills and Knowledge** Group and sort materials into solids, liquids or gases. Observe and explain that some materials change state when they are heated or cooled and measure or research the temperature in degrees Celsius (˚C) at which materials change state. Ask relevant scientific questions, independently, about the world around them and begin to identify how they can answer them. Describe the water cycle using words or diagrams and explain the part played by evaporation and condensation.	**Skills and Knowledge** Compare, sort and group living things from a range of environments, in a variety of ways, based on observable features and behaviour. Compare, sort and group living things from a range of environments, in a variety of ways, based on observable features and behaviour. Explain how unfamiliar habitats, such as a mountain or ocean, can change over time and what influences these changes. Describe how environments can change due to human and natural influences and the impact this can have on living things.	**Skills and Knowledge** Compare common household equipment and appliances that are and are not powered by electricity. Construct operational simple series circuits using a range of components and switches for control. Predict and describe whether a circuit will work based on whether or not the circuit is a complete loop and has a battery or cell. Construct operational simple series circuits using a range of components and switches for control. Describe materials as electrical conductors or insulators.	**Skills and Knowledge** Compare common household equipment and appliances that are and are not powered by electricity. Construct operational simple series circuits using a range of components and switches for control. Predict and describe whether a circuit will work based on whether or not the circuit is a complete loop and has a battery or cell. Construct operational simple series circuits using a range of components and switches for control. Describe materials as electrical conductors or insulators.

		Compare how the volume of a sound changes at different distances from the source.				
	Outcomes: Learn about the human digestive system. Explore the main parts, starting with the mouth and teeth, identifying teeth types and their functions. Finally, link this learning to animals' diets and construct food chains to show the flow of energy.	**Outcomes:** Learn about sound, how sound is made and how sound travels as vibrations through a medium to the ear. Learn about pitch and volume and find out how both can be changed.	**Outcomes:** Understand solids, liquids and gases and their characteristic properties. Observe how materials change state as they are heated and cooled, and learn key terminology associated with these processes.	**Outcomes:** Know about grouping living things, known as classification. Study the animal and plant kingdoms and use and create classification keys to identify living things.	**Outcomes:** Learn about electrical appliances and safety. Construct simple series circuits and name their parts and functions, including switches, wires and cells. Investigate electrical conductors and insulators and identify common features of conductors.	**Outcomes:** This project teaches children about electrical appliances and safety. They construct simple series circuits and name their parts and functions, including switches, wires and cells. They investigate electrical conductors and insulators and identify common features of conductors.

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 5	**Topic:** **Earth and Space**	**Topic:** **Forces and Mechanisms**	**Topic:** **Living things and their Habitats**	**Topic:** **Animals including Humans**		**Topic:** **Properties and Changes of Materials**
	Concept: **Earth and Space**	**Concept:** **Forces**	**Concept:** **Reproduction**	**Concept:** **Human Reproduction**	**Concept:** **Human Reproduction**	**Concept:** **Materials**
	Skills and 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. Describe or model the movement of the Moon relative to Earth. The Moon orbits Earth, completing a full orbit every month (27.3 days). Describe the Sun, Earth and Moon as approximately spherical bodies and use this knowledge to understand the phases of the Moon and eclipses.	**Skills and Knowledge:** Gather and record data and results of increasing complexity, selecting from a range of methods (scientific diagrams, labels, classification keys, tables, graphs and models). Data can be recorded and displayed in different ways, including tables, bar and line charts, classification keys and labelled diagrams. Explain that objects fall to Earth due to the force of gravity. 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. Compare and describe, using a range of toys,	**Skills and Knowledge:** Describe the process of human reproduction. Humans reproduce sexually, which involves two parents (one female and one male) and produces offspring that are different from the parents. Group and sort plants by how they reproduce. 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. Label and draw the parts of a flower involved in sexual reproduction in plants (stamen, filament, anther, pollen, carpel, stigma, style, ovary, ovule and sepal).	**Skills and 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. Compare the life cycles of animals, including a mammal, an amphibian, an insect and a bird. 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. Describe the process of human reproduction. Humans reproduce sexually, which involves two parents (one female and one male) and produces offspring that are different from the parents. Group and sort plants by how they reproduce. 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. Label and draw the parts of a flower involved in sexual reproduction in plants (stamen, filament, anther, pollen, carpel, stigma, style, ovary, ovule and sepal).		**Skills and Knowledge:** Compare and group everyday materials by their properties, including hardness, solubility, transparency, conductivity (electrical and thermal) and magnetism. Materials can be grouped according to their basic physical properties. Properties include hardness, solubility, transparency, conductivity (electrical and thermal) and magnetism. 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. Some materials (solutes) will dissolve in liquid (solvents) to form a solution. The

	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. Use the idea of Earth's rotation to explain day and night, and the Sun's apparent movement across the sky. 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	models and natural objects, the effects of water resistance, air resistance and friction. 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. Describe and demonstrate how simple levers, gears and pulleys assist the movement of objects. 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.	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. Describe the life process of reproduction in some plants and animals. 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	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. Describe the life process of reproduction in some plants and animals. 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. Gather and record data and results of increasing complexity, selecting from a range of methods (scientific diagrams, labels, classification keys, tables, graphs and models). Data can be recorded and displayed in different ways, including tables, bar and line charts, classification keys and labelled diagrams. 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. 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. 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.	solute can be recovered by evaporating off the solvent by heating. Separate mixtures by filtering, sieving and evaporating. 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 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. Identify, demonstrate and compare reversible and irreversible changes. Irreversible changes include burning, rusting, decaying and chemical reactions.

	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.		reproduction involves one parent and produces offspring that is identical to the parent.	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.	Identify, demonstrate and compare reversible and irreversible changes. Reversible changes include heating, cooling, melting, dissolving and evaporating.
	Outcome: Know our Solar System and its spherical celestial bodies. Be able to describe the movements of the Earth and the other planets relative to the Sun, the Moon relative to Earth, and the Earth's rotation to explain day and night.	**Outcome:** Learn about the forces of gravity, air resistance, water resistance and friction, and explore their effects. Learn about mechanisms, their uses and how they allow a smaller effort to have a greater effect.	**Outcome:** Know the animal life cycles, including the human life cycle. Explore human growth and development to old age, including the changes experienced during puberty and human reproduction.	**Outcome:** Know the animal life cycles, including the human life cycle. Explore human growth and development to old age, including the changes experienced during puberty and human reproduction.	**Outcome:** Know about the wider properties of materials and their uses. Learn about mixtures and how they can be separated using sieving, filtration and evaporation. Study reversible and irreversible changes, and use common indicators to identify irreversible changes.

	Autumn 1	Autumn 2	Spring	Summer
Year 6	**Topic:** **Evolution and Inheritance**	**Topic:** **Light Theory**	**Topic:** **Electrical Circuits and Components** **Science Week and SATS**	**Topic:** **Circulatory System**
	Concept:	**Concept:** **L**ight	**Concept:** **E**lectricity	**Concept:**
	Skills and Knowledge: Research unfamiliar animals and plants from a range of habitats, deciding upon and explaining where they belong in the classification system. Living things are classified into groups, according to common observable characteristics and based on similarities and differences. Explain that living things have changed over time, using specific examples and evidence. 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	**Skills and Knowledge:** Identify that light travels in straight lines. Light travels in straight lines. Explain that, due to how light travels, we can see things because they give out or reflect light into the eye. 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.	**Skills and Knowledge:** Plan and carry out a range of enquiries, including writing methods, identifying variables and making predictions based on prior knowledge and understanding. 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. Explain how the brightness of a lamp or volume of a buzzer is affected by the number and voltage of cells used in a circuit. 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. Compare and give reasons for variations in how components in electrical circuits function (brightness of lamps; volume of buzzers and function of on or off switches). 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	**Skills and 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). Choose an appropriate approach to recording accurate results, including scientific diagrams, labels, timelines, classification keys, tables, models and graphs (bar, line and scatter), linking to mathematical knowledge. Data can be recorded and displayed in different ways, including tables, bar and line charts, scatter graphs, classification keys and labelled diagrams. Report on and validate their findings, answer questions and justify their methods, opinions and conclusions, and use their results to suggest improvements to their methodology, separate facts from opinions, pose further questions and make predictions for what they might observe. 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.

	ancestry and evidence for this comes from fossil discoveries and genetic comparison. Identify that living things produce offspring of the same kind, although the offspring are not identical to either parent. 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. Describe how animals and plants can be bred to produce offspring with specific and desired characteristics (selective breeding). 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	Once light reaches the retina, it is transmitted to the brain via the optic nerve. Explain that, due to how light travels, we can see things because they give out or reflect light into the eye. 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. Explain, using words, diagrams or a model, why shadows have the same shape as the objects that cast them and how shadows can be changed.	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. Create circuits using a range of components and record diagrammatically using the recognised symbols for electrical components. There are recognised symbols for different components of circuits.	Report on and validate their findings, answer questions and justify their methods, opinions and conclusions, and use their results to suggest improvements to their methodology, separate facts from opinions, pose further questions and make predictions for what they might observe. 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. Independently 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. Name and describe the purpose of the circulatory system and the functions of the heart, blood vessels and blood. 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. 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. Explain the impact of positive and negative lifestyle choices on the body.

	crops that are disease-resistant. Identify how animals and plants are adapted to suit their environment, such as giraffes having long necks for feeding, and that adaptations may lead to evolution. 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.	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.			Lifestyle choices can have a positive (exercise and eating healthily) or negative (drugs, smoking and alcohol) impact on the body. Explain that the circulatory system in animals transports oxygen, water and nutrients around the body. 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. Report on and validate their findings, answer questions and justify their methods, opinions and conclusions, and use their results to suggest improvements to their methodology, separate facts from opinions, pose further questions and make predictions for what they might observe. 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.
	Outcome: This project teaches children how living things on Earth have changed over time and how fossils provide evidence for this. They learn how characteristics are passed from parents to their offspring and how variation in offspring can affect their survival, with changes (adaptations) possibly leading to the evolution of a species.	**Outcome:** This project teaches children about the way that light behaves, travelling in straight lines from a source or reflector, into the eye. They explore how we see light and colours, and phenomena associated with light, including shadows, reflections and refraction.	**Outcome:** This project teaches children about electrical circuits, their components and how they function. They recognise how the voltage of cells affects the output of a circuit and record circuits using standard symbols. It also teaches children about programmable devices, sensors and monitoring. They combine their learning	**Outcome:**	**Outcome:** This project teaches children about the transport role of the human circulatory system, its main parts and primary functions. They learn about healthy lifestyle choices and the effects of harmful substances on the body.

			to design and make programmable home devices.		