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Subject Overview Skegness Infant and Junior Academies

Subject – Science

Our Curriculum Partners for Science

Knowing More and Remembering More

The first lesson for each unit of work is used to review prior learning from previous units, ready for their development in the new one. Opportunities for information recall are included in science lessons to ensure knowledge is transferred into long-term memory. These activities may be in the form of labelling diagrams, discussing a concept cartoons or knowledge organisers, or low stakes quizzes that focus on prior learning. Additional opportunities on interactive programmes, such as Bedrock and Kahoot, enable children to revisit key topic vocabulary.

		Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
		Knowing me, knowing you	Tell me a Tale	Where shall we go?	Footprints	The Great Outdoors	What if...?
Nursery		Use all their senses in hands-on exploration of natural materials. Talk about what they see, using a wide vocabulary Explore collections of materials Explore collections of materials, identifying with similar and/or different properties Explore how things work Explore and talk about forces (push and pull) Can identify what you need to wear for each season and why Understands that the weather changes and that in different countries you have different weather Understand the difference between plants and animals Plants seeds and ares for growing plants with support Show an awareness of the life cycle of a butterfly					
Reception		Explore the natural world around them, describing what they see, hear and feel whilst outside Talks about differences between materials and changes they notice Explores the natural world around them, making observations and drawing pictures of animals and plants Explore and talk about forces (push and pull) Explores non-contact forces (gravity and magnetism) Can identify what you need to wear for each season and why Understand the effect of changing seasons on the natural world around, discussing when and how things grow Can say what plants need to survive Can talk about different life cycles Understands the need to respect and care for the natural environment and all living things					
		Time Travellers	**Above and beyond**	**Telling Tales**	**A World Apart**	**Blue Planet**	**This is Me**
Year 1	Disciplinary vocabulary:	Topic Overview **Seasonal Change** Key Criteria • Understand there are four seasons. • Understand the changes that take place in autumn. • Understand the changes that take place in winter.	Topic Overview **Exploring everyday materials** Key Criteria • Identify and name a variety of everyday materials. • Distinguish between an object and the	Topic Overview **Animals including humans, All about animals** Key Criteria • Discover animal families. • Learn about the differences between mammals and birds.	Topic Overview **Plants** Key Criteria • Understand that seeds grow into plants. • Identify the basic parts of a plant and tree.	Topic Overview **Exploring everyday materials 2** Key Criteria • Build a structure strong enough to withstand wind. • Build a waterproof structure.	Topic Overview **Animals including humans, All about me** Key Criteria • Discover the basic parts of the human body. • Learn about your eyes and sight. • Learn about your ears and hearing.

		• Understand the changes that take place in spring. • Understand the changes that take place in summer. • Investigate how you can measure rainfall. **Key Findings:** • Throughout the year the UK experiences four seasons. Spring, Summer, Autumn, Winter. Each season brings changes. • In Autumn, the days get shorter. The weather begins to get colder throughout autumn, plants and animals start to get ready for winter. Leaves change colour and fall off the trees and some animals hibernate. • In winter, days are short. The weather turns very cold in winter and the mornings are dark. The weather can turn so cold that we can sometimes get sleet, ice or snow. • In spring, the weather starts to get warmer but there can still be lots of rain. Daylight gets longer and the plants and animals that went to sleep in winter, start to wake up. Lots of animals have their babies in spring. • In summer, the weather gets warmer. We have lots of sun and often have to wear sun cream to protect our skin. The days are lighter for longer. • Recording data and explain findings. Key vocabulary Season, hibernate, temperature, weather	material it is made from. • Describe the properties of everyday materials. • Identify objects that are natural and those that are manmade. • Predict and identify if an object will float or sink. • Explore which materials are best for different objects. **Key Findings:** • Name and describe wood, metal, plastic and fabric. • Objects are made from materials. Chair-plastic Jumper-fabric Table- wood • Describe a range of materials using the properties- hard, soft, stretchy, stiff, dull, rough, smooth, bendy, not bendy, opaque, transparent. • Natural materials are made by nature and are not man made. Man made materials are made by human beings. • Some objects will float and some will sink. Some materials are absorbent (soak up water) and some are non-absorbent. These materials	• Learn about the differences between amphibians, reptiles and fish. • Discover the type of food living things eat. • Explore the differences between wild animals and pets. • Explain the characteristics of an animal. **Key findings:** • Animals can be grouped into different families: fish, amphibians, reptiles, birds and mammals. • A mammal is an animal that breathes air, has a backbone, and grows hair at some point during its life. Birds have feathers and a beak and lay hard-shelled eggs • Amphibians hatch in water and breathe with gills. They then develop lungs so the adults can breathe air and spend time on land. Amphibians are cold-blooded animals. Amphibians are all vertebrates. Amphibians don't have hair. • Reptiles are cold-blooded, which means that they cannot control their body temperature.	• Understand that different plants can grow in the same environment. • Know the differences between deciduous and evergreen trees. • Know that fruit trees and vegetables are varieties of plants. • Record the growth of a plant. **Key Findings:** • When seeds are planted in soil and they are watered, they will grow into plants. • Flowers- stem, root, flower, leaf, petal, bud. • Tree- trunk, branches, roots, leaves, bark. • Plants and flowers can be sorted by colour. • Deciduous- Deciduous trees lose their leaves in autumn, unlike evergreen trees, which keep their leaves all year round. Key vocabulary Deciduous, evergreen, fruit, vegetable Key Scientists: Tim Smit Key Scientific Experiments: Bean experiment Key Enrichment Experiences: Science Week	• Understand the properties of glass and its uses. • Understand that materials are used to create a variety of furniture. • Explore a variety of fabrics and understand their different properties. • Explain the uses of materials and why they are suitable. **Key Findings:** • Some materials are stronger than others. Cardboard or wood is needed for the house to withstand wind. Bricks are used for real houses. • Plastic or rubber are waterproof- waterproof materials do not absorb water. • Glass is transparent so that it can let light in and be seen through. • Wood-for strong furniture like tables. Fabric for sofas to be comfortable. • Consolidating learning from the whole unit. Key vocabulary Strong, suitable, properties, waterproof	• Explore the tongue and taste. • Explore your sense of touch. • Discover how your nose smells. **Key findings:** • Basic parts of the human body: head neck arm elbow leg knee face eye hair mouth foot teeth. • Eyes allow us to see. • Ears allow us to hear. Some sounds are pleasant and some are unpleasant. • Tongues have taste buds that allow us to taste different flavours: sweet, salty sour bitter, flavour smoky meaty • Skin helps us to feel and our fingertips are sensitive to touch. We can identify different textures through touch. • Smells enter the nose when we breathe in. A patch of skin with mucus (snot) at the back of the nose traps these smells. Key vocabulary Body, brain, sound, taste Key Scientists: Elizabeth Garrett Anderson

		Key Scientists: George James Symons Key Scientific Experiments: Rain in a jar	need to be used for objects that need to be waterproof. Key vocabulary Material, property, opaque, transparent Key Scientific Experiments: Which materials absorb liquid? (link to STAR vocabulary)	• Fish is a cold-blooded vertebrate that has fins and a tail, and which uses gills to breathe underwater. • Living things can be grouped by what they eat. Carnivore- meat eater. Herbivore- plant eater and omnivore eats both meat and plants. • Wild animals survive without humans in their natural habitat. Pets need humans to take care of them. Pets live in human habitats. Key vocabulary Warm blooded, cold blooded, herbivore, omnivore, carnivore Key Scientists: Carl Linnaeus			
Year 2		Topic overview **Uses of everyday materials** Key Criteria • Identify different material and their uses • Understand how to select the right materials to build a bridge • Explore and test the stretchiness of materials • Understand materials can change their shape by twisting, bending, squashing or stretching • Learn about Charles Macintosh and explore how materials are suitable for different purposes	Topic overview **Animals including humans- Growth** Key Criteria • Describe the needs of animals for survival • Describe the needs of humans for survival • Explore the importance of eating the right food • Describe what a healthy balanced diet looks like • Investigate the impact of exercise on our bodies	Topic overview **Plants** Key criteria • Know the difference between seeds and bulbs. • Design an experiment to find out what plants need to grow. • Describe what plants need to grow and stay healthy. • Describe the life cycle of a plant. • Observe and record the growth of plants over time.	Topic overview **Animals including humans- Life cycles** Key criteria • Learn how to order the stages of the human life cycle. • Describe the stages of life from adulthood to old age. • Learn how to match offspring to their parent. • Explore the life cycle of a chicken. • Describe the life cycle of a butterfly. • Explore the life cycle of a frog.	Topic overview **Living things and their habitats** Key criteria • Compare the differences between things that are living, dead and things that have never been alive. • Identify and name a variety of plants and animals in a microhabitat. • Design a suitable microhabitat where living things could survive. • Find out what animals eat to	Topic overview **Living things and their habitats** **Habitats around the world** Key criteria • Learn about habitats. • Appreciate that environments are constantly changing. • Explore the rainforest and its problems. • Describe life in the ocean. • Discover the Arctic and the Antarctic habitat. • Create a model of a habitat. **Key findings** • A habitat is a place where living organisms

		• Discover which materials change shape when making a road with John McAdam **Key findings** • Know what a material is and know the properties (transparent, opaque, rigid, flexible) of a variety of everyday materials (paper, wood, metal, glass, plastic, fabric) Explain why some materials are suitable for different uses. • Some materials are stronger than others. Understand that materials differ in strength and can be strengthened by changing their structure • Some materials will stretch when weight is applied but others will not. The shape of objects may change when stretched. Compare how some objects change after stretching while other objects return to their original form. • When force is applied some materials will bend, twist, squash and stretch. Children to give examples of materials that will and will not. Compare how the shapes of objects change when they are twisted, bent, squashed or stretched. Explain why bending, twisting, stretching or squashing objects is important in everyday life. • Charles Macintosh is known for his invention of waterproof fabric. Know that some materials are suitable or unsuitable for particular purposes. Understand the properties of materials that make them suitable or unsuitable for particular purposes. Link the suitability of materials for particular purposes with the uses of everyday tools. • Understand that some materials can be melted	• Investigate the importance of hygiene **Key findings** • Understand the basic needs of animals (water, food, air) Explain how animals adapt and survive by ensuring their basic needs are met. • Understand the basic needs of humans (food, water, air) Know and explain the difference between needs and wants. • Name the five food groups (carbohydrates, fats, protein, dairy, fruits and vegetables) and explain the importance of each for human health. (energy, bone strength, growth, tooth strength) • Explain that a balanced diet needs the right amount of each food group. Eating too much processed food is not always a healthy choice. • Understand that regular exercise is important for our heath. It strengthens our bodies and helps to keep our hearts healthy. • Good hygiene keeps us healthy and reduces the spread of germs. Key vocabulary: Nutrition, exercise, hygiene, carbohydrate, protein	• Understand that plants adapt to suit their environment. **Key findings:** • A seed is a part of a plant from which a new plant can grow. A bulb is a plant bud that begins to grow underground. • Plants need sunlight, water and air to be healthy. Other factors such as soil and fertilisers will impact growth. • Understand that plants need space, water, sunlight and a suitable temperature to grow. Explain how a plant makes its own food through the process of photosynthesis. Explain that plants use carbon dioxide, sunlight and water to create glucose. • Plants begin life as a seed or bulb, when planted, the seed will germinate, the roots begin to grow downwards and the shoot grows towards the light. Once the plant is above the soil, it is called a seedling, it uses light from the sun for photosynthesis. The plant grows, pollen is taken to other plants, new seeds are formed and the cycle begins again. • Record results and write a simple conclusion. Key vocabulary: Photosynthesis, oxygen, carbon dioxide, germination, pollination	**Key findings** • Know the stages of a human life cycle: baby, toddler, child, teenager, adult, elder adult. • Baby: cannot look after themselves and cannot yet walk. Child: becomes more independent and stronger. Teenager: the body changes a lot. Adult: the body is fully grown and the strongest. Elderly: hair turns grey and wrinkles get deeper. • Match offspring to a parent but know that some offspring are harder to match as they don't look like their parent (tadpole, caterpillar) • Egg, caterpillar, chrysalis, adult butterfly. • Frogspawn, tadpole, froglet, frog, laying eggs. Key vocabulary: Life cycle, reproduction, metamorphosis, transformation, offspring, foetus Key Scientists: Maria Sibylla Merian Key Enrichment Experiences: Science Week	survive in their habitats. • Understand food chains. • Understand the journey food makes from the farm to the supermarket. **Key findings** • There are 7 characteristics of living things (move, reproduce, respire, senses, grow, excrete and need nutrition) things that were once alive will have been able to do these things. • A microhabitat is a smaller habitat within a larger habitat. Smaller living things live in a microhabitat, such as insects and funguses. • Different living things need different conditions to survive. Within the habitat consider: shelter, food, location, water, plants. • All animals need to eat to survive. Carnivore eats meat. Herbivore eats plants, omnivore eats both. • A food chain begins with a producer- plants. Herbivores feed on the primary producer. Carnivores feed on the herbivores (secondary consumer) Decomposers • Understand that food we eat comes from a natural source.	live. Name different habitats from around the world (rainforest, polar, ocean, desert) • Humans are having an impact on environmental changes. Children to identify how litter can impact the environment and wildlife. • Rainforests are disappearing. They are being cut down for wood and space, pollution is causing damage and animals are being hunted by poaches. Key vocabulary: Rainforest, ocean, desert, arctic, ecosystem, endangered Key Scientists: Rachel Carson

		Know that some materials can be melted to change their shape Know that some materials can be melted and mixed with other materials to change their properties Key vocabulary: Material, property, stretchy, elastic, force, bend Key Scientists: Charles Macintosh Key Scientific Experiments: Which materials are best for making an umbrella for the children in Quest? (English link)	Key Scientists: Louis Pasteur Key Scientific Experiments: What impact does exercise have on our bodies? Key Enrichment Experiences: Visit from Morrisons supermarket about healthy food and a balanced diet.	Key Scientists: Jane Colden Key Scientific Experiments: Designing an experiment to find out what plants need to grow.		Key vocabulary: Microhabitat, producer, consumer, survive, reproduce, respire Key Scientists: Jane Goodall Key Scientific Experiments: Making a microhabitat Key Enrichment Experiences: Visit to Woodside Wildlife Park	
Year 3		Topic overview **Rocks-fossils** · Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. · Describe in simple terms how fossils are formed when things that have lived are trapped within rock. · Recognise that soils are made from rocks and organic matter. **Key Scientists:** Mary Anning **Key Scientific Experiments:** How hard/soft is this rock? Water bottle experiment **Key Enrichment Experiences:** **Key vocabulary:** sedimentary, metamorphic, igneous, erosion, transportation **Key findings:** • That rocks can be grouped based on their appearance or properties (e.g. colour, texture, hardness and permeability).	Topic overview **Light** · Recognise that they need light in order to see things, and that dark is the absence of light. · Notice that light is reflected from surfaces. · Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. · Recognise that shadows are formed when the light from a light source is blocked by an opaque object. · Find patterns in the way that the size of shadows change. · Find patterns in the way that the size of shadows change **Key Scientists:** Albert Einstein **Key Scientific Experiments:** Shadow hunt-Making shadows Experimenting with shadows and distance	Topic overview **Forces-magnets** · Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. · Describe magnets as having two poles. · Predict whether two magnets will attract or repel each other, depending on which poles are facing. **Key Scientists:** William Gilbert **Key Scientific Experiments:** Investigate which objects are magnetic. **Key Enrichment Experiences:** **Key vocabulary:** attract, repel, magnetic, magnetic field, forces, friction, surface **Key findings:**	Topic overview **Forces-magnets** · Compare how things move on different surfaces. · Notice that some forces need contact between two objects, but magnetic forces can act at a distance. · Observe how magnets attract or repel each other and attract some materials and not others. · Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. · Describe magnets as having two poles. · Predict whether two magnets will attract or repel each other, depending on which poles are facing. **Key Scientists:** William Gilbert **Key Scientific Experiments:** Investigate how things move on different surfaces.	Topic overview **Plants** · Identify and describe the functions of different parts of flowering plants: roots; stem/trunk; leaves; and flowers. · Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant. · Investigate the way in which water is transported within plants. · Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. **Key Scientists:** Sir Joseph Banks **Key Scientific Experiments:** Crime scene-plant on the floor Investigate what a plant needs to survive.	Topic overview **Animals including humans** · Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food – they get nutrition from what they eat. · Identify that humans and some other animals have skeletons and muscles for support, protection and movement. **Key Scientists:** Diane France **Key Scientific Experiments:** Food groups- sorting food into the main food groups- understanding the purpose of each food group. Investigating nutritional information to achieve a balanced diet. **Key Enrichment Experiences:** **Key vocabulary:** Nutrition, diet, vitamins, minerals, fats, proteins, carbohydrates, healthy, energy **Key findings:**

		• That rocks may contain grains, crystals or fossils. • That grains and crystals appear differently and can be used to classify rocks. • That soils are made from rocks and dead matter. • The relationship between the properties of rocks and their uses. • That fossils can form from the remains of living things. That rocks can change over time (e.g. erosion and weathering).	**Key Enrichment Experiences:** **Key vocabulary:** light source, pupil, retina, opaque, translucent, transparent **Key findings:** • Light travels from a source (e.g. the Sun, light bulbs and torches). • Light is needed to see things and that dark is the absence of light. • Light from the Sun can be dangerous and how to protect their eyes. • All materials reflect light. • Shadows form when the light from a light source is blocked by an opaque object. • Shadows change as a result of changing the position of the light source and changing the distances between the light source, object and surface. • Shadows change position and length throughout the day as the Sun changes position in the sky.	• Examples of contact and non-contact forces. • Some forces are a result of contact between two surfaces but some forces can act at a distance (e.g. magnetism). • Magnets have a north and south pole. • Some examples of magnetic materials, including iron and nickel, and how they react to a magnet and each other. • Some different examples of magnets, including bar, horseshoe, button and ring. • Some uses of magnets. • Friction is a contact force that acts between two surfaces to slow an object down. • Magnetism is a non-contact force that affects objects containing magnetic metal. • The opposite poles of a magnet attract one another and like poles repel one another. • Rougher surfaces have more friction between them than smoother surfaces. • The strength of different magnets may vary.	**Key Enrichment Experiences:** Science Week-Sublime science **Key vocabulary:** attract, repel, magnetic, magnetic field, forces, friction, surface **Key findings:** • Examples of contact and non-contact forces. • Some forces are a result of contact between two surfaces but some forces can act at a distance (e.g. magnetism). • Magnets have a north and south pole. • Some examples of magnetic materials, including iron and nickel, and how they react to a magnet and each other. • Some different examples of magnets, including bar, horseshoe, button and ring. • Some uses of magnets. • Friction is a contact force that acts between two surfaces to slow an object down. • Magnetism is a non-contact force that affects objects containing magnetic metal. • The opposite poles of a magnet attract one another and like poles repel one another. • Rougher surfaces have more friction	**Key Enrichment Experiences:** **Key vocabulary:** pollination, fertilisation, germination, dispersal **Key findings:** • The functions of the basic parts of a plant and the relationship between structure and function. • Water is transported within a plant from the root, through the stem, to the leaves. • Plants need water, light, air, nutrients and a suitable temperature for growth and health. • The needs for growth and health vary from plant to plant. • The life cycle of a plant from seed to mature plant. • Flowers are the reproductive organs of a plant. • Pollination is the transfer of pollen to the female (part of the) flower. • The process of seed formation is the growth of a seed after pollination. • Different methods of seed dispersal and the benefits of each	• Animals can be grouped based on the presence of a skeleton. • The skeleton in humans and some animals is used for movement, protection and support. • The muscular system in humans and some animals works with the skeleton for movement. • The main bones in the body. • Animals, including humans, need the right types and amount of nutrition. • Humans cannot make their own food; therefore, they eat to get the nutrition needed. • There are nutrient groups (carbohydrates, protein, fats, fibre, vitamins, minerals and water) with their own functions in the body. • A balanced diet should include all nutrient groups. • Animals have different diets.

					between them than smoother surfaces. • The strength of different magnets may vary.		
Year 4		Topic overview **Electricity** · identify common appliances that run on electricity · construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers · identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery · recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit · recognise some common conductors and insulators, and associate metals with being good conductors. **Key Scientists:** Benjamin Franklin Alessandro Volta **Key Scientific Experiments:** Investigate different circuits. Making circuits and testing if materials conduct electricity. Testing if more batteries have an impact on making a circuit brighter using data loggers. **Key Enrichment Experiences:** **Key vocabulary:** series circuit, conductor, components, insulator **Key findings:** • That all electrical appliances need a power source, including batteries or mains electricity. • That an electrical circuit needs a complete path for the electrical charge to flow through.	Topic overview **Electricity** · identify common appliances that run on electricity · construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers · identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery · recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit · recognise some common conductors and insulators, and associate metals with being good conductors. **Key Scientists:** Benjamin Franklin Alessandro Volta **Key Scientific Experiments:** Investigate different circuits. Making circuits and testing if materials conduct electricity. Testing if more batteries have an impact on making a circuit brighter using data loggers. **Key Enrichment Experiences:** **Key vocabulary:** series circuit, conductor, components, insulator **Key findings:**	Topic overview **Sound** · Identify how sounds are made, associating some of them with something vibrating. · Recognise that vibrations from sounds travel through a medium to the ear. · Find patterns between the pitch of a sound and features of the object that produced it. · Find patterns between the volume of a sound and the strength of the vibrations that produced it. · Recognise that sounds get fainter as the distance from the sound source increases. **Key Scientists:** Alexander Graham Bell **Key Scientific Experiments:** Panpipes made from straws and shorter the straw the lower the pitch. Make telephones. Investigate using tuning forks to see the vibrations. **Key Enrichment Experiences:** **Key vocabulary:** vibrations, source, sound wave, amplitude, particles, distance, soundproof, eardrum, vacuum **Key findings:** • Sound is a result of vibrations. • Vibrations from sounds travel through mediums to the ear.	Topic overview **Animals including humans** · Describe the simple functions of the basic parts of the digestive system in humans. · Identify the different types of teeth in humans and their simple functions. · Construct and interpret a variety of food chains, identifying producers, predators and prey. **Key inventor:** Washington & Lucius Sheffield **Key Scientific Experiments:** **Key Enrichment Experiences:** Science Week-Sublime science **Key vocabulary:** producer, consumer, predator, prey, herbivore, carnivore, omnivore **Key findings:** • The main organs of the human digestive system are the mouth, teeth, tongue, oesophagus, stomach, small and large intestines and have different functions. • The different types of human teeth are incisors, canines, premolars and molars and have different functions. • Teeth can be damaged by sugary	Topic overview **States of matter-solids, liquids and gases** . compare and group materials together, according to whether they are solids, liquids or gases . observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C) . identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature **Key Scientists:** Alfred Barnhard Nobel **Key Scientific Experiments:** Does temperature have an impact on the speed of evaporation even if there is the same amount of water? Inside water cycle. **Key Enrichment Experiences:** **Key vocabulary:** Solid, liquid, gas, water vapour, condensation, precipitation, evaporation, collection **Key findings:** • All substances around us can exist as solids, liquids and gases. • A property of a solid is that it keeps its	Topic overview **Living things and their habitats** · Recognise that living things can be grouped in a variety of ways · Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment · Recognise that environments can change and that this can sometimes pose dangers to living things. **Key Scientists:** Carl Linnaeus Rachel Carson **Key Scientific Experiments:** Pond dipping. An experiment to test if pesticides can pollute our oceans and harm animals. **Key Enrichment Experiences:** **Key vocabulary:** invertebrates, vertebrates, **Key findings:** • Living things can be grouped in different ways. • A classification key can be used to group and identify plants and animals. • Vertebrates are animals that have a backbone and invertebrates are animals that do not have a backbone. • Plants can be grouped into flowering or non-flowering varieties. • Flowering plants include grasses and non-

		• The main components in a series circuit. • The precautions for working safely with electricity. • That some materials allow electric charge to pass through them quickly and these are known as electrical conductors (e.g. metals). • That some materials do not allow electrical charge to pass through them easily and these are known as electrical insulators (e.g wood and plastic). • That metals are used for cables and wires because they are good conductors of electricity. • That plastic is used to cover cables and wires because it is a good insulator. • That an open switch breaks a series circuit so the components will be off. • That a closed switch completes a series circuit so the components will be on. • The relationship between bulb brightness and the number of bulbs in a circuit.	•That all electrical appliances need a power source, including batteries or mains electricity. •That an electrical circuit needs a complete path for the electrical charge to flow through. •The main components in a series circuit. •The precautions for working safely with electricity. •That some materials allow electric charge to pass through them quickly and these are known as electrical conductors (e.g. metals). •That some materials do not allow electrical charge to pass through them easily and these are known as electrical insulators (e.g wood and plastic). •That metals are used for cables and wires because they are good conductors of electricity. •That plastic is used to cover cables and wires because it is a good insulator. •That an open switch breaks a series circuit so the components will be off. •That a closed switch completes a series circuit so the components will be on. •The relationship between bulb brightness and the number of bulbs in a circuit.	• An insulating material reduces the amount of vibrations that pass through it and this can be used to protect the ears from damaging sounds. • Different materials provide different amounts of insulation against sound. • A variety of ways to change the pitch or volume of a sound. • Quicker vibrations cause higher-pitched sounds and slower vibrations cause lower-pitched sounds. • Stronger vibrations cause louder sounds and weaker vibrations cause quieter sounds. • Sounds get fainter as the distance from the sound source increases.	and acidic food, for example. • It is important to brush teeth twice a day, make good food choices and visit the dentist regularly. • The teeth of carnivores and herbivores are different for a reason. • Predators hunt for their food and prey are the animals being hunted. • Producers make their own food. • Food chains begin with a producer followed by consumers and arrows to show the energy passed on.	shape unless a force is applied to it. • A property of a liquid is that it can flow freely and take on the shape of a container. • A property of a gas is that it does not have a fixed shape and can escape from an unsealed container. • Heating causes solids to turn into liquids (melting) and liquids to turn into gases (evaporating). • Cooling causes gases to turn into liquids (condensing) and liquids to turn into solids (freezing). • Water can exist as a solid, a liquid or a gas. • The melting point of water is zero degrees Celsius and the boiling point of water is 100 degrees Celsius. • Water flows around the world in a continuous process called the water cycle. • In the water cycle, evaporation is when bodies of water are heated and turn into water vapour. • In the water cycle, condensation is the process of water vapour cooling to form water droplets in clouds, which can result in precipitation. • The rate of evaporation increases as the temperature rises.	flowering plants include ferns and mosses. • There are five main vertebrate groups: birds, mammals, reptiles, amphibians and fish. • Invertebrate groups include snails, slugs, worms, spiders and insects. • Habitats can change throughout the year, which can be dangerous for living things. • Humans can have both a positive and negative impact on the environment.

Year 5		Topic overview **Forces** · Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. · Identify the effects of air resistance, water resistance and friction that act between moving surfaces. · Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. **Key Scientists:** Sir Isaac Newton Archimedes **Key Scientific Experiments:** Can you identify the effects of friction, that acts between moving surfaces? (cars) Scientific enquiry into forces (fulcrum) Astrolabe Moon phase clock **Key Enrichment Experiences:** **Key vocabulary:** gravity, gravitational pull, buoyancy, streamlined, air resistance, upthrust **Key findings:** • Gravity is a non-contact force that pulls objects together. • Air resistance and water resistance are both types of friction. • Unsupported objects fall towards the Earth because of gravity. • Friction, air resistance and water resistance act in the opposite direction of a moving object. • When forces are unbalanced, the speed, shape or direction of an object changes.	Topic overview **Earth and Space** • Describe the movement of the Earth, and other planets, relative to the Sun in the solar system. • Describe the movement of the Moon relative to the Earth. • Describe the Sun, Earth and Moon as approximately spherical bodies. • Use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky. **Key Scientists:** Copernicus Galileo Valentina Tereshkova Guion Bluford **Key Scientific Experiments:** Order the fruit to show the planets. **Key Enrichment Experiences:** Planetarium **Key vocabulary:** orbit, planets, revolve, sphere, satellite, axis, rotate **Key findings:** • The Sun is a star at the centre of our Solar System. • The Sun, Earth and Moon are approximately spherical bodies. • The names, order and relative positions of the planets and other main celestial bodies. • A moon is a celestial body that orbits a planet and give examples of moons that orbit other planets.	Topic overview **Properties and changes of materials.** · Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. · Know that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution. · Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. · Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. · Demonstrate that dissolving, mixing and changes of state are reversible changes. · Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda. **Key Scientists:** Marie Curie **Key Scientific Experiments:** Investigate if different materials will dissolve when mixed in water and form a solution. Oozing Oobleck **Key Enrichment Experiences:** **Key vocabulary:**	Topic overview **Properties and changes of materials.** · Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. · Know that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution. · Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. · Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. · Demonstrate that dissolving, mixing and changes of state are reversible changes. · Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda. **Key Scientists:** Marie Curie **Key Scientific Experiments:** Balloon and bottle experiment to show gas can be created from a reaction between materials. Decide how mixtures might be separated, including through filtering, sieving and evaporating. Investigate reversible and irreversible.	Topic overview **Living things and their habitats** · Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. · Describe the life process of reproduction in some plants and animals. **Key Scientists:** Charles Darwin Sir David Attenborough Jane Goodall **Key Scientific Experiments:** Observing the growing and movements of caterpillars, as well as the chrysalis stage. **Key Enrichment Experiences:** **Key vocabulary:** egg, larva, pupa, nymph, adult **Key findings:** • A life cycle shows the changes an animal or plant goes through until the reproduction of a new generation when the cycle starts again. • All living things must reproduce for the species to survive. • Sexual reproduction requires two parents whereas asexual reproduction only requires one parent. • There are different processes plants and animals use to reproduce (asexual and sexual reproduction).	Topic overview **Animals including humans** • Describe the changes as humans develop to old age. **Key Scientists:** Dr Alexa Irene Canady Elizabeth Blackwell **Key Scientific Experiments:** Timeline of human life. **Key Enrichment Experiences:** **Key vocabulary:** reproduce, baby, toddler, adolescent, adult **Key findings:** • How to describe the human life cycle, including the stages of growth and development (baby, toddler, child, teenager, adult, elderly). • How to describe changes that occur during puberty (in boys and girls). • Gestation periods vary across mammals.

		• When forces are balanced, the speed, shape or direction of an object stays the same. • Some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. • Rougher surfaces have more friction between them than smoother surfaces and how that may affect movement. • The larger the surface area of an object, the greater the air or water resistance it creates.	• The Earth and other planets orbit around the Sun. • The tilt of the Earth and its orbit around the Sun causes the seasons. • The Moon orbits around the Earth. • How the Earth's rotation causes day and night and the apparent movement of the Sun across the sky.	solution, particles, suspensions, reversible, irreversible **Key findings:** • To describe a broader range of materials and their properties, including hardness, solubility, transparency, conductivity and response to magnets. •Dissolving, mixing and changes of state are reversible changes. •Some changes result in the formation of new materials, which are usually irreversible (e.g. burning, rusting, the action of acid on bicarbonate of soda). •Some substances will dissolve in a liquid to form a solution. •The factors that affect the time taken to dissolve, including temperature and stirring. •Some liquids and solids can be separated using sieving, filtering and evaporation and to describe these processes.	**Key Enrichment Experiences:** Science Week-Sublime science **Key vocabulary:** sieve, filter, evaporate, condense, magnetic **Key findings:** • To describe a broader range of materials and their properties, including hardness, solubility, transparency, conductivity and response to magnets. • Dissolving, mixing and changes of state are reversible changes. • Some changes result in the formation of new materials, which are usually irreversible (e.g. burning, rusting, the action of acid on bicarbonate of soda). • Some substances will dissolve in a liquid to form a solution. • The factors that affect the time taken to dissolve, including temperature and stirring. • Some liquids and solids can be separated using sieving, filtering and evaporation and to describe these processes.		
Year 6		Topic overview **Light** · Recognise that light appears to travel in straight lines. · Use the idea that light travels in straight lines to explain that objects	Topic overview **Electricity** • Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.	Topic overview **Evolution and Inheritance** • Recognise that living things have changed over time and that fossils provide information about living	Topic overview **Classification (Living things and their Habitats)** · Describe how living things are classified into broad groups according to common observable characteristics	Topic overview **Animals including humans** • Identify and name the main parts of the human circulatory system, and describe the functions of the	Topic overview **Animals including humans** • Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.

		are seen because they give out or reflect light into the eye. · Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. · Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. **Key Scientists:** Sir David Brewster **Key Scientific Experiments:** Predict and then measure the width of each shadow and try to find what kind of set-up produces the widest shadows. Investigation-children learn that a periscope is a device made from 2 angled mirrors that enables the user to see around obstacles. Investigate what happens to its shadow when an object is moved towards a light source. **Key Enrichment Experiences:** **Key vocabulary:** incident ray, reflected ray, refraction, light source. **Key findings:** • Light travels in a straight line from a light source. • Luminous objects are seen as a result of light directly entering the eye, whereas non-luminous objects reflect light into the eye. • Shiny surfaces reflect light uniformly. • When light is reflected off a surface, its direction changes. • Mirrors and periscopes work using reflection of light on smooth surfaces. • Shadows have the same shape as the objects that cast them as a result of light travelling in straight lines.	• Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. • Use recognised symbols when representing a simple circuit in a diagram. **Key Scientists:** James Watt Alessandro Volta Benjamin Franklin Thomas Edison **Key Scientific Experiments:** Investigate the effect of changing the number and voltage of cells in an electrical circuit. Create a set of electrical traffic lights. **Key Enrichment Experiences:** **Key vocabulary:** volts, voltage, circuit, symbol, cell, current, electrons, resistance **Key findings:** • A variety of components in a series circuit (including buzzer and motor). • Conventions are used to draw circuit diagrams, including the recognised symbols for common components and using straight lines. • The voltage of a circuit can be changed and this affects bulb brightness (or buzzer volume).	things that inhabited the Earth millions of years ago. • Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. • Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. **Key Scientists:** Charles Darwin **Key Scientific Experiments:** Sticky dogs. Bird beaks investigation. Mr Men inheritance investigation. Switchzoo. **Key Enrichment Experiences:** **Key vocabulary:** reproduction, offspring, parents, siblings, characteristics, inheritance, adaptation, variation, evolution, evolve **Key findings:** • To know that 'organism' is a term used to refer to an individual living thing. • To know that micro-organisms are incredibly small and cannot usually be seen by the naked eye. • To know the characteristics of the different groups of vertebrates and commonly found invertebrates.	and based on similarities and differences, including micro-organisms, plants and animals. · Give reasons for classifying plants and animals based on specific characteristics. **Key Scientists:** Carl Linnaeus Evelyn Cheesman **Key Scientific Experiments:** Grouping and classifying into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals. **Key Enrichment Experiences:** Science Week-Sublime science **Key vocabulary:** amphibian, bacteria, micro-organism, microscope, species **Key findings:** • To know that 'organism' is a term used to refer to an individual living thing. • To know that micro-organisms are incredibly small and cannot usually be seen by the naked eye. • To know the characteristics of the different groups of vertebrates and commonly found invertebrates.	heart, blood vessels and blood. • Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. • Describe the ways in which nutrients and water are transported within animals, including humans. **Key Scientists:** Marie M Daly **Key Scientific Experiments:** Measure heart rates. Blood experiment. **Key Enrichment Experiences:** **Key vocabulary:** veins, arteries, pulse, clotting, blood vessels, oxygenated blood, deoxygenated blood, capillaries, plasma **Key findings:** • Living things have changed over time. • Fossils provide information about living things that inhabited the Earth millions of years ago. • Characteristics are passed from parents to their offspring, but all offspring vary from their parents. • Over time, variation in offspring can affect animals' chances of survival in particular environments. • Animals and plants have adapted to suit their environment over many millions of years and this process can be called evolution.	• Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. • Describe the ways in which nutrients and water are transported within animals, including humans. **Key Scientists:** Alexander Fleming **Key Scientific Experiments:** **Key Enrichment Experiences:** **Key vocabulary:** caffeine, nicotine, alcohol, cannabis, cocaine **Key findings:** • The main parts of the human circulatory system (heart, blood vessels and blood). • The heart pumps blood around the body. • Blood vessels transport blood around the body. • Blood transports vital substances around the body, including oxygen and nutrients. • The relationships between different organ systems. • The impact of diet, exercise, drugs and lifestyle on the way a body functions. • The heart rate is the number of beats per minute. • Exercise increases heart rate.

		• There are relationships between light sources, objects and shadows. • The distance between the object and the screen affects the size of the shadow. • The angle of a reflected ray is affected by the angle of the incoming ray on a smooth surface.					