KHALSA PRIMARY SCHOOL
SCIENCE OVERVIEW- NUTURING OUR FUTURE SCIENTISTS

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INTENT

At Khalsa Primary School, our science curriculum has been designed to provide our children with a rich scientific experience which encourages our inquisitive children to pose valid scientific questions that will allow them to follow lines of enquiry about the world we live in.

Our aim is to ensure that pupils develop their skills of enquiry and investigation using technology where appropriate to promote and progress their creative thinking. During science lessons, pupils will learn to ask scientific questions and begin to appreciate the way Science will affect their future at a personal, national, and even at a global level.

Enrichment Opportunities in Science

STEM integrated activities

Pupils will complete STEM (Science, Technology, Engineering and Mathematics) integrated activities within the range of different topics completed. Through experiments, coding, robotics, and engineering challenges, they explore scientific concepts and technology while reinforcing mathematical skills. These activities prepare them for future careers and inspire a lifelong love for learning.

High Quality Learning

We collaborate with our local secondary school to offer heart dissection activities to our year 6 pupils. This partnership provides hands-on experience in biology and health sciences, preparing them for future studies and careers in related fields.

At the end of each topic, pupils explore various career paths within the different fields of science.

Science Week

During Science Week, our primary school buzzes with exploration and excitement as students delve into a range of hands-on activities. From captivating experiments in chemistry to engaging demonstrations in physics and biology, pupils immerse themselves in the wonders of science. We also host guest speakers and organise competitions to further fuel their curiosity and passion for STEM subjects. Through Science Week, we aim to inspire a lifelong love for science and nurture the next generation of innovators.

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Nursery	**Biology**	**Biology**	**Physics**	**Biology**	**Biology**	**Biology**
	Our Body **What are the main parts of our body?**	**The Senses** **How do our senses work?**	**Health and Safety** **Why must we stay safe?**	**Animals:** **What animals will we discover?**	**Plants:** **How do plants help us?**	**Insects:** **Where do insects live?**
	Scientist:	**Scientist:**	**Scientist:**	**Scientist:**	**Scientist:**	**Scientist:**
	Key Content: Learn about basic body parts. Learn the body changes. Learn that we are unique.	**Key Content:** Learn about sight, taste, touch. Explore ways to make sound. Learn about hearing and sight. Learn about smell and touch.	**Key Content:** Stay safe when using electricity. Learn about your home and what you need. Know people you can trust Learn about first aid.	**Key Content:** Learn about animals. Know where animals live. Know where birds live and need. Learn about animals on a farm. Know about dinosaurs.	**Key Content:** Learning about plants. Learn where plants come from. Learn how to care for plants.	**Key Content:** Where do insects and invertebrates live? What are insects and invertebrates?
	Working scientifically: Explore the natural world around them, making observations. Know some similarities and differences between the natural world around them.	**Working scientifically:** Explore the natural world around them, making observations. Know some similarities and differences between the natural world around them.	**Working scientifically:** Explore the natural world around them, making observations. Know some similarities and differences between the natural world around them.	**Working scientifically:** Explore the natural world around them, making observations. Know some similarities and differences between the natural world around them.	**Working scientifically:** Explore the natural world around them, making observations. Know some similarities and differences between the natural world around them.	**Working scientifically:** Explore the natural world around them, making observations. Know some similarities and differences between the natural world around them.
	Key vocabulary: **observe, touch, feel, smell, listen, compare, ask questions, record, sort, group** arm, ear, eye, foot, hand, leg, nose, mouth	**Key vocabulary:** **observe, touch, feel, smell, listen, compare, ask questions, record, sort, group** eye, hear, noise, sight, sound, taste, touch, trumpet	**Key vocabulary:** **observe, touch, feel, smell, listen, compare, ask questions, record, sort, group** danger, electricity, house, safe, soap, stranger, trust, wash	**Key vocabulary:** **observe, touch, feel, smell, listen, compare, ask questions, record, sort, group** bear, bird, chicken, cow, farm, goat, pig, sheep	**Key vocabulary:** **observe, touch, feel, smell, listen, compare, ask questions, record, sort, group** garden, plant, root, seed, soil, stem, sunlight, water	**Key vocabulary:** **observe, touch, feel, smell, listen, compare, ask questions, record, sort, group** beetle, fly, honey, insect, ladybird, snail, spider, worm
Reception	**Biology**	**Physics**	**Physics**	**Chemistry**	**Physics**	**Biology**
	Food **Where does food come from?**	**Forces** **How do objects move?**	**Machines** **Why do we need machines?**	**Materials** **What do we use materials for?**	**Space** **What is in Space?**	**Weather and Seasons** **Why is it always raining?**
	Scientist:	**Scientist:**	**Scientist:**	**Scientist:**	**Scientist:**	**Scientist:**
	Key Content: Learn about your diet and staying healthy. Learn about chicken and eggs. Learn about cows and milk. Learn about wheat and flour. Learn about fruit and vegetables. Learn about measuring.	**Key Content:** Know what happens when you push and pull. Know when things sink or swim.	**Key Content:** Know about different types of transport. Learn how machines help to make jobs easier. Learn about non-living things.	**Key Content:** Know things can change shape. Know about melting. Learn where your knitted jumper comes from. Understand usefulness of wool. Know about materials like mirror. Know how water changes.	**Key Content:** Learn about rockets. Explore outer space.	**Key Content:** Learn about rain, ice and water. Describe why air moves. Know about snow and melting. Learn about rainbows in the sky. Learn about seasonal spring, summer, autumn and winter changes.
	Working scientifically: Explore the natural world around them, making observations. Know some similarities and differences between the natural world around them.	**Working scientifically:** Explore the natural world around them, making observations. Know some similarities and differences between the natural world around them.	**Working scientifically:** Explore the natural world around them, making observations. Know some similarities and differences between the natural world around them.	**Working scientifically:** Explore the natural world around them, making observations. Know some similarities and differences between the natural world around them.	**Working scientifically:** Explore the natural world around them, making observations. Know some similarities and differences between the natural world around them.	**Working scientifically:** Explore the natural world around them, making observations. Know some similarities and differences between the natural world around them.
	Key vocabulary: **observe, touch, feel, smell, listen, compare, ask questions, record, sort, group** cheese, chicken, cow, eggs, milk, pig, sheep, wheat	**Key vocabulary:** **observe, touch, feel, smell, listen, compare, ask questions, record, sort, group** fast, float, press, pull, push, sink, slow, suck	**Key vocabulary:** **observe, touch, feel, smell, listen, compare, ask questions, record, sort, group** bus, car, hammer, horse, plane, toy, train, wheel	**Key vocabulary:** **observe, touch, feel, smell, listen, compare, ask questions, record, sort, group** cold, freeze, ice, jumper, melt, mirror, smooth, wool	**Key vocabulary:** **observe, touch, feel, smell, listen, compare, ask questions, record, sort, group** Jupiter, launch, planet, rocket, star, travel, Uranus, Venus	**Key vocabulary:** **observe, touch, feel, smell, listen, compare, ask questions, record, sort, group** beetle, fly, honey, insect, ladybird, snail, spider, worm

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1	**Biology**	**Chemistry**	**Chemistry**	**Biology**	**Biology**	**Biology**
	Animals including humans	**Everyday Materials**	**Everyday Materials**	**Plants**	**Animals including humans**	**Seasonal changes**
	What is special about me?	**What are the materials we use?**	**Which materials are best for building?**	**What plants are growing here?**	**Why are animals different?**	**How do seasons affect the weather?**
	Scientist: paramedic	**Scientist: civil engineer**	**Scientist: building engineer**	**Scientist: gardener**	**Scientist: bee keeper**	**Scientist: weather forecaster**
	Key Content: Learn about the basic body parts. Learn about eyes and sight. Learn about ears and hearing. Learn about tongues and taste. Explore sense of touch. Learn how our noses smell.	**Key Content:** Identify and name everyday materials. Distinguish between object and the material it is made from. Describe material properties. Identify natural and man-made. Predict and identify if objects will float or sink. Explore which materials are best for different objects.	**Key Content:** Build a strong structure to withstand wind. Build a waterproof structure. Know properties and uses of glass. Know materials are used to make furniture. Explore fabrics and understand their different properties. Explain uses and suitability of materials.	**Key Content:** Understand that seeds grow into plants. Identify basic plant and tree parts. Understand different plants can grow in the same environment. Know the difference between deciduous and evergreen trees. Know that fruit trees and vegetables are varieties of plants. Record the growth of a plant.	**Key Content:** Discover animal families. Learn about the differences between mammals and birds. Learn about the differences between amphibians, reptiles and fish. Discover the types of food living things eat. Explore the difference between wild animals and pets. Explain the characteristics of an animal.	**Key Content:** Recognise there are four seasons. Understand the changes that take place in autumn. Understand the changes that take place in winter. Understand the changes that take place in spring. Understand the changes that take place in summer. Investigate how to measure rainfall.
	Working scientifically: Identify, name, draw and label the basic parts of the human body, saying which part of the body is associated with each sense. Use observations to compare and contrast animals first hand or through videos and photographs, describing how they identify and group them. Grouping and classifying. Explore and answer questions about animals in their habitat. Using observations and ideas to suggest answers to questions. Performing simple tests. Observe changes over time.	**Working scientifically:** Compare and group a variety of everyday materials on the basis of their simple physical properties. Explore, name, discuss and raise and answer questions about everyday materials becoming familiar with the names of materials and properties. Explore and experiment with a wide variety of materials. Identifying and classifying. Distinguish between an object and the material it is made from. Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. Describe the simple physical properties of a variety of everyday materials. Observing closely using simple equipment. Performing simple tests.	**Working scientifically:** Distinguish between an object and the material it is made from. Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. Identify and classify materials. Gathering and recording data to help in answering questions. Describe the simple physical properties of everyday materials. Compare and group everyday materials on the basis of their simple physical properties. Observing closely using simple equipment. Explore and experiment with a wide variety of materials. Performing simple tests.	**Working scientifically:** Identify and describe basic structure of common flowering plants, including trees, becoming familiar with common flower names, deciduous and evergreen. Know plant structures: leaves, flowers, petals, fruit, roots, bulb, seed, trunk, branches, stem. Closely observe how plants grow, using scientific vocabulary. Collecting and sorting data. Observing closely using simple equipment. Observe growth of flowers and vegetables they have planted. Keep records of how plants have changed over time, for example, the leaves falling off trees and buds opening; compare and contrast what they have found out about different plants. Identifying and classifying.	**Working scientifically:** Using the local environment through the year to explore and answer questions about animals in their habitats. Identify, classify, name common animals, fish, birds, amphibious, reptiles, and mammals. Use observations and ideas to suggest answers to questions. Know how to take care of animals taken from their environment and the need to return them safely after study. Group, classify, describe and compare the structure of a variety of common animals. Identify and name common animals that are carnivores, herbivores and omnivores. Observing closely using simple equipment.	**Working scientifically:** Observe and describe weather associated with the seasons and how day length varies. Observe and task about changes in the weather and the seasons. Using observations and ideas to suggest answers to questions Record data using tables and charts about the weather; and making displays of what happens in the world around them, including day length, as the seasons change. Observe and talk about changes in the weather and the seasons. Performing simple tests. Gathering and recording data to help in answering questions. Observe changes across the four seasons.
	Key vocabulary: **observe, observations, question, answer, describe, biology.** brain, body, ear, head, pupil, sound, taste, tongue	**Key vocabulary:** **identify, classify, equipment, observe, test, chemistry.** fabric, material, metal, plastic, property, opaque, transparent, wood	**Key vocabulary:** **sort, group, predict, observe, test, investigate, build.** brick, clay, cotton, roof, slate, strong, window frame, window pane	**Key vocabulary:** **observe closely, equipment, collect, record, data, perform, test, group, classify.** deciduous, evergreen, fruit, petal, plant, seed, stem, vegetable	**Key vocabulary:** **identify, classify, observe, questions, answers, equipment,** bird, cold-blooded, fish, herbivore, mammal, reptile, warm-blooded	**Key vocabulary:** **observe, describe, question, test, data, answer** autumn, hibernate, season, spring, summer, temperature, weather, winter

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 2	**Chemistry**	**Biology**	**Biology**	**Biology**	**Biology**	**Biology**
	Uses of everyday materials	**Living things and their habitats**	**Living things and their habitats**	**Animals including humans**	**Animals including humans**	**Plants**
	How do we use materials?	**What lives in this habitat?**	**Who lives in habitats around the world?**	**What do we need for our health and survival?**	**Why do all living organisms have a life cycle?**	**How do plants grow in different habitats?**
	Scientist: renewable materials engineer	**Scientist: farmer**	**Scientist: land surveyor**	**Scientist: health trainer**	**Scientist: veterinary surgeon**	**Scientist: game keeper**
	Key Content: Identify different materials and their uses. Understand how to select the right materials to build a bridge. Explore and test the stretchiness. Understand that materials can change their shape by twisting, bending, squashing or stretching. Find out about Charles Macintosh; explore how materials are suitable for different purposes. Discover which materials change shape when making a road with John McAdam.	**Key Content:** Explore and 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 survive in their habitats. Understand a food chain. Understand food's journey from the farm to the supermarket.	**Key Content:** Learn about habitats. Appreciate that environments are constantly changing. Explore the rainforest and its problems. Describe life in the ocean. Discover the Arctic and Antarctic habitat. Create a model of a habitat.	**Key Content:** 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. Investigate the importance of hygiene.	**Key Content:** Order the stages of the human life cycle. Describe the stages of a human life cycle. Identify the offspring and parent of an animal. Explore the life cycle of a chicken. Describe the life cycle of a butterfly. Explore the life cycle of a frog.	**Key Content:** 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. Understand that plants adapt to suit their environment.
	Working scientifically: To make links between materials and how they are used. Identify and compare materials suitability for a specific use. To test different materials absorbency. Find out how solid objects shapes can be changed, using scientific vocabulary. To test whether recycled materials are suitable to create musical sounds from. To recognise that different objects can have different properties, and to sort objects according to how their shapes can be changed. Performing simple tests to compare balls to find out how bouncy they are.	**Working scientifically:** Explore the differences between things that are living, dead and things that have never been alive. Identify, classify and name a variety of plants and animals in their habitats, including microhabitats. Sorting and classifying. Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food. Performing simple tests. Gather and recording data to help in answering questions.	**Working scientifically:** Identify that most living things live in habitats to which they are suited to. Describe how different habitats provide for basic needs of the different kinds of animals and plants and how they depend on each other. Explore and compare the differences between the habitats. Performing simple tests. Gather and record data to help in answering questions. Identifying and classifying. Asking relevant questions and using primary and secondary research sources to answer them. Observing closely and gathering and recording data in help in answering questions.	**Working scientifically:** Understand that animals, including humans, have offspring that grow into adults. Discovering how seeds are formed by observing the different stages of plant life cycles over a period of time. Asking relevant questions and using different types of scientific enquiries to answer them. Noticing patterns. Gathering and recording data to help in answering questions. Describe what happens to us as we grow older. Use observations and ideas to suggest answers to questions.	**Working scientifically:** Research, identify and describe the basic needs of animals and humans, for survival (water, food, air). Use different types of scientific enquiry to gather and record data. Identify and classify the stages of a life cycle. Asking simple questions about life cycles. Observing closely, to suggest answers to their questions.	**Working scientifically:** Observe and describe how seeds and bulbs grow into mature plants. Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. Understand the requirements of plants for germination, growth and survival, as well as, the processes of reproduction and growth in plants.
	Key vocabulary: **investigate, experiment, make links, test, explain, perform.** bend, construction, elastic, force, material, obstacle, property, stretchy	**Key vocabulary:** **identify, sort, perform, gather, record, data, answer, questions.** consumer, excrete, habitat, microhabitat, producer, reproduce, respire, survive	**Key vocabulary:** **sort, group, predict, observe, test, investigate, build.** brick, clay, cotton, roof, slate, strong, window frame, window pane	**Key vocabulary:** **relevant questions, scientific enquiry, patterns, gather, record, data, describe, identify, classify.** carbohydrate, dairy, exercise, fat, healthy, hygiene, nutrition, protein	**Key vocabulary:** **record, differences, similarities, scientific ideas, observe closely.** foetus, froglet, life cycle, offspring, reproduction, transformation, metamorphosis, womb	**Key vocabulary:** **design experiment, observe, gather, record data.** carbon dioxide, crop, forests, germination, glucose, oxygen, photosynthesis, pollination

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 3	**Chemistry**	**Biology**	**Chemistry**	**Physics**	**Biology**	**Physics**
	Scientific Enquiry	**Animals including humans**	**Rocks**	**Forces and magnets**	**Plants**	**Light**
	How do we investigate scientific questions?	**Why is it important to stay fit and healthy?**	**Why are rocks important?**	**Are magnets a type of force?**	**How does a plant get all the nutrients it needs?**	**Why do we see shadows at certain times of the day?**
	Scientist: nuclear decommissioning engineer	**Scientist: ambulance care assistant**	**Scientist: production director**	**Scientist: stress engineer**	**Scientist: ecologist**	**Scientist: analytical technician**
	Key Content: How can a solar oven be made more effective: posing questions and writing predictions. How can a solar oven be made more effective: recording and presenting results. Cleaning coins: writing a method and carrying out a practical test. Cleaning coins: writing a conclusion. Making a cake: fair testing, controls and variables. Making a cake: scientific enquiry.	**Key Content:** Explore the 5 key food groups. Learn about the nutrition in the food we eat. Learn about the different types of skeletons. Learn about the human skeleton. Learn about animals and their skeletons. Explore the role of muscles.	**Key Content:** Explore the formation and properties of igneous rocks. Explore the formation and properties of sedimentary and metamorphic rocks. Weathering and the suitability of rocks for different purposes. Explore how water contributes to the weathering of rocks. Understand how fossils are formed. Explore different types of soil.	**Key Content:** Explore contact and non-contact forces. Compare how things move on different surfaces. Explore different types of magnets. Explore the properties of magnets and everyday objects that are magnetic. Understand that magnetic forces can act at a distance. Explore the everyday uses of magnets.	**Key Content:** Compare the effect of different factors on plant growth. Identify and describe the functions of parts of a flowering plant and how they are used in photosynthesis. Investigate how water is transported within plants. Explore what flowers do in the life cycle of flowering plants. Understand pollination and how seeds are dispersed. Compare the effect of different factors on plant growth.	**Key Content:** Identify the difference between light sources and non-light sources. Explore the light that comes from the sun and how to stay safe. Explore materials which are reflective. Discover how shadows are formed. Investigate how shadows change throughout the day. Investigate how you can change the size of a shadow.
	Working scientifically: Ask relevant question and use scientific enquiries to answer it. Make systematic, careful observations, take accurate measurements using a range of equipment. Record findings using scientific language, labelled diagrams, bar charts, and tables. Identify differences, similarities or changes related to scientific ideas. Report findings from enquiries. Setting up simple practicals, comparative and fair tests. Using scientific evidence to answer questions. Use results for conclusions, and raise further questions.	**Working scientifically:** Identify that animals and humans, need the right types and amount of nutrition, and cannot make their own food; they get nutrition from what they eat. Gather, record, classify and present data in a variety of ways to help in answering questions. Using straightforward scientific evidence to answer questions or to support their findings. Report findings from enquiries, written explanations, displays or presentations of results and conclusions. Record findings using scientific language, labelled diagrams, keys, bar charts and tables.	**Working scientifically:** Compare and group different rocks, based on appearance and simple physical properties. Report on enquiry findings; written explanations, results and conclusions. Explore how and why rocks might have changed over time. Use results to draw conclusions, make predictions and raise further questions. Describe how fossils are formed when things that have lived are trapped within rock. Identify differences, similarities or changes related to ideas and. Recognise that soils are made from rocks and organic matter.	**Working scientifically:** Notice that some forces need contact between 2 objects, but magnetic forces can act at a distance. Describe magnets as having 2 poles. Predict whether 2 magnets will attract or repel each other, depending on which poles are facing. Setting up simple practical enquiries, comparative and fair tests. Notice that some forces need contact between 2 objects, but magnetic forces can act at a distance.	**Working scientifically:** Explore what plants need for growth and how it varies. Ask relevant question and use different enquiries to answer it. Setting up practical enquiries, comparative and fair tests. Gather, record, classify and present data in a variety of ways to help in answering question. Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.	**Working scientifically:** Gather, record, classify and present data in a variety of ways to help in answering questions. Recognise that shadows are formed when the light from a light source is blocked by an opaque object. Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Identifying differences, similarities or changes related to simple scientific ideas and processes.
	Key vocabulary: **relevant, systematic, write conclusions, labelled diagrams.** conclusion, control experiment, data, equipment, enquiry, fair test, method, plausible, practical, prediction, record, scientific investigation	**Key vocabulary:** **presenting data, scientific evidence, support the findings.** balanced, biceps, endoskeleton, exoskeleton, hamstrings, mineral, nutrition label, radius, tibia, rib cage, spine, vitamin	**Key vocabulary:** **suggest improvements, systematic, results, conclusions.** acid rain, decompose, erosion, fragments, fossil, igneous rock, intrusive igneous rock, extrusive igneous rock, magma, sedimentary rock, metamorphic rock, weathering	**Key vocabulary:** **scientific enquiry, accurate measurements, record, data.** attract, compass, force, friction, magnet, magnetic field, magnetism, motion, non-contact force, orienteering, repel, texture	**Key vocabulary:** **gather data, written explanations, results, new questions.** anther, chlorophyll, fertiliser, filament, photosynthesis, phloem, pollen, potassium, nectar, transpiration, stomata, xylem	**Key vocabulary:** **design experiment, suggest improvements, systematic, results, conclusions.** cast, fluorescent, high visibility, light, puppet, position, ray, reflect, shadow, shape, ultra-violet rays, vitamin D

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 4	**Biology**	**Biology**	**Biology**	**Chemistry**	**Physics**	**Physics**
	Animals including humans	**Living things and their habitats**	**Living things and their habitats**	**States of matter**	**Sound**	**Electricity**
	Where does our food go?	**Why do scientists classify organisms?**	**Have humans had a positive impact on planet Earth?**	**Why does temperature affect states of matter?**	**Why does sound get fainter when you move away?**	**What would happen if there is no electricity?**
	Scientist: food scientist	**Scientist: animal technician**	**Scientist: water scientist**	**Scientist: research and development technician**	**Scientist: acoustics consultant**	**Scientist: manager of production**
	Key Content: Identify the organs in the digestive system. Describe the functions of the main organs in the digestive system. Identify the types of human teeth and their functions. Investigate the effects of different liquids on the teeth. Understand food chains. Explore food webs.	**Key Content:** Explore different habitats. Research a habitat. Explore how animals can be classified. Create a classification key. Adaptations and classification within species. Explore and classify pond plants.	**Key Content:** Describe ecosystems and how they are affected by changes in the seasons. Understand human impact on the environment through deforestation. Explore air pollution. Understand water pollution. Explore methods that can be used to conserve water. Understand that humans can have a positive impact on nature.	**Key Content:** Compare and group the 3 states of matter. Explore how particles behave in solids, liquids and gases. Investigate melting points. Explore freezing and boiling points. Explore evaporation and condensation. Understand the water cycle.	**Key Content:** Identify how sounds are made. Explore how vibrations from sounds travel through a medium to the ear. Explore sound insulation. Explore volume. Explore pitch. Explore sounds from near and from far.	**Key Content:** Explore electrical appliances and electrical safety. Learn about electrical components in a series circuit. Investigate electrical circuits. Explore conductors and insulators. Learn about electrical switches. Investigate how electrical components can change within a circuit.
	Working scientifically: Describe the functions of parts of the human digestive system. Record findings using scientific language, labelled diagrams, keys, bar charts, and tables. Identify the different human teeth and their simple functions. Set up practical enquiries, comparative and fair tests. Use results to draw conclusions, make predictions, suggest improvements and raise further questions. Making systematic and careful observations.	**Working scientifically:** 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. Identifying differences, similarities or changes related to simple scientific ideas and processes. Gather, record, classify and present data in a variety of ways to help in answering questions. Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.	**Working scientifically:** Recognise environments can change and this can pose dangers to living things. Gather, record, classify and present data to answer questions. Use scientific evidence to support their findings. Record findings using scientific language, labelled diagrams, keys, bar charts, and tables. Report on findings from enquiries, written explanations, presentations of results and conclusions. Make systematic and careful observations and, take accurate measurements.	**Working scientifically:** Compare and group materials according to state: solids, liquids or gases. Observe some materials change state when heated or cooled; measure temperature at which this happens in degrees Celsius (°C). Make systematic and careful observations; taking accurate measurements using standard units, using thermometers. Record findings using scientific language, labelled diagrams, keys, bar charts, and tables. Use results to draw conclusions, make predictions for new values, suggest improvements and raise further questions.	**Working scientifically:** Identify how sounds are made, when something vibrates. Identify differences, similarities or changes related to simple scientific ideas and processes. Find patterns between the volume of a sound and the strength of the vibrations that produced it. Make systematic and careful observations; take accurate measurements using standard units, using a range of equipment. Report findings from enquiries, including written explanations, presentations of results and conclusions.	**Working scientifically:** Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. Using straightforward scientific evidence to answer questions or to support their findings. Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Gathering, recording, classifying and presenting data in a variety of ways to help in answering question. Ask relevant questions and using difference types of scientific enquiries to answer them.
	Key vocabulary: **understand impact, systematic observation, write conclusions, labelled diagrams.** consumer, digestive system, enamel, fluoride, hide, incisors, molars, oesophagus, peristalsis, predator, saliva, tundra	**Key vocabulary:** **classification system, similarities and differences, scientific evidence, support the findings.** adapted, blubber, camouflage, classify, classification key, coastal, ecosystem, grassland, oxygenised, region, species, sub-group	**Key vocabulary:** **scientific evidence, systematic, results, accurate measurements.** biodiversity, contaminate, conservation areas, deforestation, drought, emissions, freshwater, marine sanctuaries, migrate, monsoon, pesticide, pollution	**Key vocabulary:** **scientific conclusions, accurate measurements, accurate observations.** boiling point, condensation, evaporation, freezing point, gas, liquid, melting point, particles, substance, solid, thermometer, water vapour	**Key vocabulary:** **gather data, written explanations, draw tables for results, new questions.** decibels, energy, instruments, materials, medium, particles, pitch, reflect, sound source, source, vibration, volume	**Key vocabulary:** **specific questions, explain why, suggest solutions, systematic, results, conclusions.** batteries, bulb, circuit, conductor, control, current, electricity, hydropower, insulator, switch, voltage, wind turbines

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 5	**Physics**	**Chemistry**	**Chemistry**	**Biology**	**Physics**	**Biology**
	Forces	**Properties and changes of materials**	**Properties and changes of materials**	**Animals including humans**	**Earth and apace**	**Living things and their habitats**
	Why do objects fall towards the earth?	**Why do some material conduct heat?**	**Can we reverse all chemical reactions?**	**What happens to our bodies as we grow older?**	**How is Earth moving through space?**	**Why are life cycles constantly changing?**
	Scientist: operation support worker	**Scientist: nuclear engineer**	**Scientist: chemical engineer**	**Scientist: health physicist**	**Scientist: astronaut**	**Scientist: geoscientist**
	Key Content: Explore gravity and the life and work of Isaac Newton. Examine the connection between air resistance and parachutes. Explore factors which affect an object's ability to resist water. Investigate the effects of friction on different surfaces. Investigate mechanisms - levers and pulleys. Investigate mechanisms – gears.	**Key Content:** Exploring properties of materials. Explore thermal conductors and thermal insulators. Explore the hardness of materials. Discover materials that become soluble in water. Investigate the solubility of materials. Explore how mixtures could be separated by filtering, sieving, evaporating or magnets.	**Key Content:** Use evaporation to recover the solute from a solution. Recognise and describe reversible changes. Observe chemical reactions and describe how we know new materials are made. Investigate rusting reactions. Investigate burning reactions. Investigate chemical reactions - acids and bicarbonate of soda.	**Key Content:** Identify the key stages of a mammal's life cycle. Explore the gestation periods of mammals. Learn about foetal development. Investigate the hand span of different aged children. Learn about the changes experienced during puberty. Describe the changes humans may experience during adulthood and old age.	**Key Content:** Explore the solar system and its planets. Understand the heliocentric model of the solar system. Explain the Earth's movement in space. Explain the Earth's rotation and night and day. Explain the movement of the Moon. Design a planet using knowledge gained.	**Key Content:** Understand the life process of a plant. Understand the life cycles of mammals. Compare the life cycles of insects and amphibians. Understand the life cycle of birds and reptiles. Know about the life and work of Jane Goodall and David Attenborough. Research and present the life cycle of a creature.
	Working scientifically: Identifying scientific evidence that has been used to support or refute ideas or arguments. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Report and present findings from enquiries, include conclusions, causal relationships and explain results, in oral and written forms.	**Working scientifically:** Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Using test results to make predictions to set up further comparative and fair tests.	**Working scientifically:** Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible. Report and present findings from enquiries, include conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations. Plan different scientific enquiry to answer questions, including recognising and controlling variables where necessary. Identify scientific evidence that has been used to support or refute ideas or arguments.	**Working scientifically:** Describe the changes as humans develop to old age. Record data and results of increasing complexity using scientific labelled diagrams, scatter graphs, bar and line graphs. Report and present findings from enquiries and explanations of and a degree of trust in results. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Identifying scientific evidence that has been used to support or refute ideas or arguments.	**Working scientifically:** 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. Identify scientific evidence that has been used to support or refute ideas or arguments. Report and present findings from enquiries - include conclusions, causal relationships and explanations of and a degree of trust in results. Using test results to make predictions to set up further comparative and fair tests.	**Working scientifically:** Describe the reproduction process in some plants and animals. Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. Plan different scientific enquiries to answer questions, include recognise and control variables where necessary. Identify scientific evidence used to support or refute ideas or arguments. Report and present enquiry findings – include conclusions and explanations of and a degree of trust in results - in oral and written forms such as displays and other presentations.
	Key vocabulary: **accurate measurements, repeated readings, casual relationships.** buoyant, friction, Galileo Galilei, gravity, lever, newton, parachute, pulley, Sir Isaac Newton, streamlined, up thrust, water resistance	**Key vocabulary:** **planning different enquires, comparative testing, variables.** conduction, conductive, dissolve, evaporation, filtering, force, hardness, magnetic, solute, solvent, substance, thermal	**Key vocabulary:** **identify scientific evidence, control variables, degree of trust.** carbon dioxide, chemical change, combustion, corrosion, effervescence, evaporate, extinguish, fair test, reaction, reversible, solute, solvent	**Key vocabulary:** **scatter graphs, precise measurements, accurate observations.** adolescent, breeding, dependant, embryo, foetus, hormones, offspring, gestation, pregnant, prenatal, puberty, toddler	**Key vocabulary:** **refute ideas, written explanations, draw tables for results, new questions.** astronomy, axis, gas giants, geocentric, heliocentric, moon, orbit, phase, solar system, terrestrial planet, waning, waxing	**Key vocabulary:** **specific arguments/ideas, explain why, suggest solutions, conclusions.** asexual, endangered, fertilisation, living organism, metamorphosis, monotreme mammal, naturalist, placental mammal, primatologist, reproduction

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 6	**Physics**	**Physics**	**Biology**	**Biology**	**Biology**	**Biology**
	Electricity	**Light**	**Animals including humans**	**Living things and their habitats**	**Evolution and inheritance**	**Living things and their habitats**
	How are traffic lights managed?	**How does light help us see?**	**How does the heart pump blood around the body?**	**What does classification tell us?**	**Why do organisms evolve continuously?**	**Can we save our planet, our home?**
	Scientist: signalling technician	**Scientist: aerospace engineer**	**Scientist: children's nurse**	**Scientist: biotechnologist**	**Scientist: biochemist**	**Scientist: environmental consultant**
	Key Content: Describe the parts of an electric circuit. Explore voltage and its effect on an electrical circuit. Apply knowledge to identify and correct problems in a circuit. Investigate what affects the output of a circuit. Build a set of traffic lights. Apply knowledge of conductors and insulators.	**Key Content:** Explore how light travels. Explore reflection. Explore reflection and explain how it can be used to help us see. Investigate how shadows can change. Investigate how we can show why shadows have the same shape as the object that casts them. Investigate how we see objects.	**Key Content:** Understand the function of the heart and its role in the circulatory system. Identify and compare blood vessels. Explore blood. Learn how the body transports water and nutrients. Investigate what affects your heart rate. Learn about the impact of drugs and alcohol on the body.	**Key Content:** Classify living organisms. Understand the kingdoms of life. Classify living things using the Linnaean system. Identify the characteristics of different types of microorganisms. Investigate asexual reproduction through spore dispersal. Classify and describe a living organism.	**Key Content:** Understand how offspring vary and are not identical to their parents. Learn about animal adaptations. Learn about plant adaptations. Explore what we can learn from fossils. Explore the theory of evolution. Explore human evolution.	**Key Content:** Learn about climate change. Explore ways to reduce how much rubbish is sent to landfill. Explore ways to reduce energy consumption. Explore what happens when fuels are burnt. Explore the outcomes of COP26. Compare data associated with the weather.
	Working scientifically: Use recognised symbols to represent a circuit diagram. Associate bulb brightness or buzzer volume with the number and voltage of cells used. Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Using test results to set up further comparative and fair tests.	**Working scientifically:** Recognise that light appears to travel in straight lines. Explain we see when light travels from light sources to our eyes or from light sources to objects and then to our eyes. Record data and results of increasing complexity using scientific diagrams and labels. Identify evidence to support or refute ideas or arguments. Plan different scientific enquiries to answer questions, recognise and control variables. Record data and results of increasing complexity using scientific diagrams.	**Working scientifically:** Identify and name the parts of the human circulatory system: describe the functions of the heart, blood vessels and blood. Describe how nutrients and water are transported within animals, including humans. Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. Take measurements, using a range of scientific equipment, with increasing precision. Report and present findings from enquiries, include conclusions with a degree of trust in results.	**Working scientifically:** Give reasons for classifying plants and animals based on specific characteristics. Identifying scientific evidence that has been used to support or refute ideas or arguments. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs and bar and line graphs. Report and present findings from enquiries - including causal relationships and explanations of and a degree of trust in results. Plan different enquiries to answer questions, controlling variables.	**Working scientifically:** Recognise that living things produce offspring of the same kind, but offspring vary and are not identical to their parents. Identify how animals and plants are adapted to their environment in different ways and that adaptation may lead to evolution. Reporting and presenting findings from enquiries - including conclusions, causal relationships and explanations of and a degree of trust in results - in oral and written forms such as displays and other presentations. Identifying scientific evidence used to support or refute ideas.	**Working scientifically:** Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations. Identifying scientific evidence that has been used to support or refute ideas or arguments. Using test results to make predictions to set up further comparative and fair tests.
	Key vocabulary: **make predictions, use appropriate equipment, explain faults.** battery, circuit, conductor, dimmer switch, electricity, insulator, output, resistor, signal, synchronised, systematically, variable resistor	**Key vocabulary:** **Increasing complexities, scientific labelled diagrams, variables.** angle, light, light source, mirror, opaque, optical, reflected, rotate, spectrum, sunshade, transparent, variable	**Key vocabulary:** **Precise measurements, control variables, degree of trust.** atrium, BPM, diet, deoxygenated, diffusion, osmosis, oxygenated, pulse, valve, ventricle, vessel	**Key vocabulary:** **specific characteristics, accurate observations, casual relationships.** cell, classification, ecosystem, habitat, kingdom, Linnaean System, living organism, microorganism, microscopic, species	**Key vocabulary:** **refute ideas, written explanations of a theory, new questions.** adaptation, ancestor, Charles Darwin, evolved, epiphytes, fossils, Homo sapiens, Mary Anning ichthyosaurus, inherit, natural selection, palaeontologist	**Key vocabulary:** **suggest solutions, conclusions using precise research and evidence.** biodegradable, combustion, conference, COP, global warming, greenhouse gases, habitat, industrial revolution, net zero, recycle, species, weather