



Subject Overview: Science

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
EYFS Working Scientifically	Plan <ul style="list-style-type: none"> Choose resources. Learn by trial and error. Find new ways to do things. Question why things happen . e.g. why is the blue dye going up the celery? 		Do <ul style="list-style-type: none"> Explore and observe the world around them using all their senses. Closely observe people and animals. Conduct simple investigations to explore scientific questions. 		Review <ul style="list-style-type: none"> Explain why some things occur and talk about changes. Develop ideas of grouping, sequencing and cause and effect. Make links and notice patterns of things in their experience (answer how and why questions). 	
Year R	Biology: Animals, Including Humans Human Body Parts <ul style="list-style-type: none"> Name basic parts of the body. 		Biology: Plants Plants <ul style="list-style-type: none"> Observe the growing of a plant from seed, understanding that this process takes a period of time. Chemistry: Everyday Materials Materials - Properties <ul style="list-style-type: none"> Explore and identify a range of different materials, beginning to explore their properties. 	Physics: Forces and Magnets Objects in Environments <ul style="list-style-type: none"> Experiment and observe how different objects interact with water, magnets, etc. Physics: Earth and Space Planets <ul style="list-style-type: none"> Know that there are other planets. 	Biology: Living Things and Their Habitats Life Cycles - Living Things <ul style="list-style-type: none"> Observe a life cycle of an animal (e.g. butterfly) over time. Make observations and drawings of animals and plants. Chemistry: Properties and Changes of Materials Changing State of Matter <ul style="list-style-type: none"> Observing melting and witnessing changes in state of matter. Physics: Seasonal Changes Seasons <ul style="list-style-type: none"> Name the four seasons and make basic observations about each one. 	Biology: Living Things and Their Habitats Habitats <ul style="list-style-type: none"> Know that animals live in different habitats.

KS1 Working Scientifically	Plan ● Asking simple questions and recognising that they can be answered in different ways.		Do ● Observing closely, using simple equipment. ● Performing simple tests. ● Identifying and classifying.		Review ● Using their observations and ideas to suggest answers to questions. ● Gathering and recording data to help in answering questions.	
Year 1	<p>Physics: Seasonal Changes Weather - Days - Seasons</p> <ul style="list-style-type: none"> ● Observe changes across the 4 seasons. ● Observe and describe weather associated with the seasons and how day length varies. <p><i>winter, summer, spring, autumn temperature, daylight, hours, night dark, Sun, Earth, Moon, weather, rain snow, ice, clouds, fog, wind</i></p> <div data-bbox="181 688 611 1157" style="border: 1px solid black; padding: 5px;"> <p>Scientific Enquiry <i>Observing Over Time:</i> How does the Sun move? Solar Observations – Children Record the position of the Sun in the Sky at different times of the day. <i>Pattern Seeking:</i> How does our local environment change over the seasons? <i>Observing Over Time:</i> How does the length of the day change? <i>Observing Over Time:</i> How does my shadow change over the day?</p> </div> <div data-bbox="181 1157 611 1255" style="border: 1px solid black; padding: 5px;"> <p>Science Trail Photography project over the year.</p> </div>	<p>Chemistry: Everyday Materials Materials - Objects - Properties</p> <ul style="list-style-type: none"> ● Distinguish between an object and the material from which it is made. ● 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. ● Compare and group together a variety of everyday materials on the basis of their simple physical properties. <p><i>materials, properties, wood, plastic, glass, metal, rock, uses, objects, waterproof, absorbent, strength, structures, brick, paper, elastic, natural, man-made, shiny, dull, smooth, rough, stretchy, stiff, opaque, transparent, hard, soft</i></p> <div data-bbox="641 1062 1071 1602" style="border: 1px solid black; padding: 5px;"> <p>Scientific Enquiry <i>Identify and Classify:</i> To compare shiny/dull materials with smooth/rough materials. <i>Comparative / Fair Test:</i> Which materials are waterproof? Which kitchen roll is most absorbent? <i>Comparative / Fair Test:</i> Which materials are opaque and transparent? Challenge – How many layers of a material do you need to make it opaque? <i>Pattern Seeking:</i> Investigating stretchy toys.</p> </div> <div data-bbox="641 1602 1071 1766" style="border: 1px solid black; padding: 5px;"> <p>Science Trail What materials are used in our local community for buildings, paths and roads?</p> </div>	<p>Biology: Animals, Including Humans Human Body Parts</p> <ul style="list-style-type: none"> ● Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. <p><i>fish, amphibian, reptile, mammal, carnivore, herbivore, omnivore, skeleton, habitat, life cycle, vertebrate, skull, bone, teeth, swim, fly, feathers, scales, fur, skin, diet, nocturnal, pet</i></p> <div data-bbox="1098 688 1528 989" style="border: 1px solid black; padding: 5px;"> <p>Scientific Enquiry <i>Comparative / Fair Test:</i> Investigating sizes of hands and feet. <i>Comparative / Fair Test:</i> Do we get taller as we get older? Class life graphing investigation – Month of birth and heights.</p> </div> <div data-bbox="1098 989 1528 1188" style="border: 1px solid black; padding: 5px;"> <p>Science Trail How does our local environment change over the seasons? Photography project over the year. (continuation from Term 1)</p> </div>		<p>Biology: Plants Plant Groups - Plant Structure</p> <ul style="list-style-type: none"> ● Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. ● Identify and describe the basic structure of a variety of common flowering plants, including trees. <p><i>root, stem, leaf, flower, air, sunlight, water, nutrient, soil, pollination, seed, growth, deciduous, evergreen, habitat, petal, wild, fruit, bulb, branch, trunk, blossom, bud, plant, oak, holly, birch, beech</i></p> <div data-bbox="2015 825 2445 1430" style="border: 1px solid black; padding: 5px;"> <p>Scientific Enquiry <i>Observing Over Time:</i> How does a daffodil grow? Plant daffodil bulbs and monitor growth over the term. <i>Comparative / Fair Test:</i> Investigate factors affecting growth of cress seeds. (Which is the best compost? How important is light for plants?) <i>Observing Over Time:</i> Grow beans – monitor growth using photos and measurements. Keep a bean diary. <i>Research:</i> What trees and plants grow in our local area? Use books and the internet to identify common plants. <i>Research:</i> What do all flowers have in common? Compare flowers.</p> </div> <div data-bbox="2015 1430 2445 1730" style="border: 1px solid black; padding: 5px;"> <p>Science Trail How can we group leaves? Observe, compare and group leaves. Which tree is the oldest? Carry out a tree survey in the local park measuring circumference using string.</p> </div>	<p>Biology: Animals, Including Humans Animal Groups</p> <ul style="list-style-type: none"> ● Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. ● Identify and name a variety of common animals that are carnivores, herbivores and omnivores. ● Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets). <p><i>sight, touch, hearing, smell, taste, legs, arms, hands, fingers, foot, eyes, nose, mouth, ears, head, human, body, heart, brain, lungs, stomach, hair, elbows, neck, teeth, food, breathe, pump, blood, think, digest</i></p> <div data-bbox="2475 995 2905 1497" style="border: 1px solid black; padding: 5px;"> <p>Scientific Enquiry <i>Identify and Classify:</i> What sort of birds live in our local area? Set up a bird table and make observations. <i>Identify and Classify:</i> Minibeasts Spiders Investigation – Web hunt, Spider observations. <i>Identify and Classify:</i> Investigating Bees – Making models to show key features of bees, observing how bees fly, local area walk – what sort of flowers attract bees? Trail <i>Identify and Classify:</i> Where do different minibeasts prefer to live?</p> </div> <div data-bbox="2475 1497 2905 1696" style="border: 1px solid black; padding: 5px;"> <p>Science Trail How does our local environment change over the seasons? Photography project over the year. (continuation from Term 1)</p> </div>

Chemistry: Everyday Materials and Their Uses

Materials - Properties - Uses

- Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.
- Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

materials, shape, suitability, solid, changes, properties, heat, insulators, conductors, forces, squashing, bending, twisting, stretching, reflective, similarities, differences, wood, metal, plastic, glass, brick, rock, paper, cardboard, uses

Scientific Enquiry

Identify and Classify: What sort of materials are in our classroom? Children make observations; try to group the materials they find.
Comparative / Fair Test: Which materials can I squash? Which are the squishiest?
Comparative / Fair Test: Which materials can I stretch? Which is the most stretchy? Measuring length with weights hanging from them – different types of plastic bags, stretchy animals. (Which superhero has the stretchiest tights?)
Comparative / Fair Test: Which material bends the most? Comparing plastic and wooden rulers with weights hanging from them.

Science Trail

What sort of materials are in our community? Children make observations of buildings, roads and pavements; try to group the materials they find.

Biology: Animals, Including Humans

Offspring - Animal Survival Needs - Diet - Exercise

- Notice that animals, including humans, have offspring which grow into adults.
- Find out about and describe the basic needs of animals, including humans, for survival (water, food and air).
- Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

animal, human, adult, parent, young, offspring, water, food, air, exercise, hygiene, environment, fossil, skeleton, body, organs, diet, healthy, height, growth, weight

Scientific Enquiry

Comparative / Fair Test: How does height change with age? Chn collect data from every class and compare.
Research: What are our bodies made up of? Investigating the skeleton and organs in the body. What is the best way to wash your hands? Children investigate different techniques to wash paint off their hands.
Comparative / Fair Test: How does exercise affect how many breaths you make every minute?

Science Trail

How does exercise affect your heart rate? Data logger investigation.

Biology: Living Things and Their Habitats

Alive/Dead - Habitats - Food

- Explore and compare the differences between things that are living, dead, and things that have never been alive.
- Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other.
- Identify and name a variety of plants and animals in their habitats, including microhabitats.
- 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.

living things, plants, animals, habitats, conditions, living, dead, alive, dark, light, water, damp, dry, micro-habitats, food, food chain, sources, food webs, producer, prey, predator, environment, local, protected, endangered, species, birds, reptiles, mammals, amphibians, fish

Scientific Enquiry

Identify and Classify: How can we group animals by their features? (Birds, Reptiles, Mammals, Fish and Amphibians)
Comparative / Fair Test: Which conditions do different minibeasts prefer? (Woodlice Investigation – make a choice chamber)

Science Trail

Comparing Habitats (local with other)
 How are different animals/plants suited to their habitats? Labelling features and explaining.

Biology: Plants

Plant Growth - Plant Survival Needs

- 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.

plants, seeds, bulbs, mature, water, light, healthy, temperature, germinate, growth, reproduce, roots, flowers, petal, stem, insects, pollen, leaves, Sun

Scientific Enquiry

Observing Over Time: How long does it take for a sunflower to reach full size? Which sunflower will be the tallest?
Observing Over Time: Plant and observe garlic bulbs growing.
 Research using Secondary Resources: What happens to a bean when it germinates? Do all beans do the same thing?
Comparative / Fair Test: How does temperature affect how quickly a plant grows?
Comparative / Fair Test: How does light level affect how quickly a plant grows?
Comparative / Fair Test: What is the best amount of water to give a plant?

Science Trail

Plant trails - compare habitats in terms of light, water and soil availability.

LKS2 Working Scientifically	Plan <ul style="list-style-type: none"> Ask relevant questions and use different types of scientific enquiries to answer them. Set up simple practical enquiries, comparative and fair tests. 		Do <ul style="list-style-type: none"> Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. Gather, record, classify and present data in a variety of ways to help in answering questions. Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. 		Review <ul style="list-style-type: none"> Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. Identify differences, similarities or changes related to simple scientific ideas and processes. Use straightforward scientific evidence to answer questions or to support their findings.
Year 3	Biology: Animals, Including Humans Nutrition - Muscles - Skeleton <ul style="list-style-type: none"> 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. <p><i>nutrition, diet, food, protein, salts, carbohydrate, minerals, vitamins, fats, sugars, balanced diet, skeleton, skull, spine, vertebrate, pairs, invertebrate. calcium, muscle, contract, relax, movement</i></p> <div data-bbox="178 1003 608 1407" style="border: 1px solid black; padding: 5px;"> <p>Scientific Enquiry <i>Research:</i> How do human skeletons compare with those of other animals? <i>Pattern Seeking:</i> Which crisps have the highest salt/fat content? Analyse data from food packaging, draw graphs and demo burning of each type of crisp to compare observations with findings (Risk Assessment Required)</p> </div> <div data-bbox="178 1407 608 1570" style="border: 1px solid black; padding: 5px;"> <p>Science Trail Healthy Versus Unhealthy tour of the Town e.g. advertising and shop displays.</p> </div>	Physics: Light Sight - Reflection - Shadows <ul style="list-style-type: none"> 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. <p><i>light, dark, absence, reflection, surface, natural, man-made, light, source, shadow, blocked, bright, dim, mirror, absorb, plane mirror, concave mirror, convex mirror, image</i></p> <div data-bbox="638 1138 1068 1612" style="border: 1px solid black; padding: 5px;"> <p>Scientific Enquiry <i>Comparative / Fair Test:</i> Where is the light brightest in our school? What is white light made from? (Prisms) <i>Pattern Seeking:</i> What factors affect the size of a shadow? Making shadow sticks and measuring shadow size. <i>Comparative / Fair Test:</i> Which sunglasses will protect our eyes best? Data logging investigation looking at light intensity.</p> </div> <div data-bbox="638 1612 1068 1776" style="border: 1px solid black; padding: 5px;"> <p>Science Trail Trail including environment Data logging investigation to investigate our local environment.</p> </div>	Chemistry: Rocks Rocks - Properties - Fossils - Soils <ul style="list-style-type: none"> 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. <p><i>waterproof, strong, hard, opaque, heavy, sedimentary, igneous, soil, metamorphic, porous, fossil, layers, erosion, inner core, outer core, mantle, crust, earthquake, volcano pebble, boulder, crystal, weathering</i></p> <div data-bbox="1098 1003 1528 1339" style="border: 1px solid black; padding: 5px;"> <p>Scientific Enquiry <i>Comparative / Fair Test:</i> Which type of rock soaks up the most water? <i>Comparative / Fair Test:</i> Challenge - Which type of rock is the heaviest? (Introduce the idea of density) <i>Comparative / Fair Test:</i> Which type of soil does water flow through the quickest?</p> </div> <div data-bbox="1098 1339 1528 1402" style="border: 1px solid black; padding: 5px;"> <p>Science Trail Rock Trail</p> </div>	Physics: Forces and Magnets Forces - Magnetic / Non-Magnetic - Poles <ul style="list-style-type: none"> Compare how things move on different surfaces. Notice that some forces need contact between 2 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 2 poles. Predict whether 2 magnets will attract or repel each other, depending on which poles are facing. <p><i>force, surface, magnet, magnetic force. attract, repel, magnetic material, poles, bar magnet, horseshoe magnet, materials, contact, non-contact, north pole, south pole, magnetic field, iron, iron filings</i></p> <div data-bbox="1558 1413 1988 1917" style="border: 1px solid black; padding: 5px;"> <p>Scientific Enquiry <i>Pattern Seeking:</i> Which materials will stick to magnets? <i>Comparative / Fair Test:</i> How far will a toy car go on different surfaces? <i>Comparative / Fair Test:</i> How many layers of card can you place between a magnet and a paperclip before it won't attract? <i>Comparative / Fair Test:</i> How close will a paperclip get to different magnets before it attracts? <i>Comparative / Fair Test:</i> Which magnet is the strongest?</p> </div> <div data-bbox="1558 1917 1988 2032" style="border: 1px solid black; padding: 5px;"> <p>Science Trail Forces in the Park</p> </div>	Biology: Plants Functions of Plant Parts - Plant Survival Needs - Plant Life Cycles <ul style="list-style-type: none"> 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. <p><i>plant, roots, stem, trunk, food, bud, leaf/leaves, flower, stalk, veins, tip, surface, edge, root hair, nutrients, anchor, support, seed, germination, seedling, growth, mature plant, flowering, pollination, seed formation, petal, pollen, nectar, seed, fruit</i></p> <div data-bbox="2463 1276 2893 1812" style="border: 1px solid black; padding: 5px;"> <p>Scientific Enquiry <i>Observing Over Time:</i> How long does it take for water to travel up a plant? (Investigating Xylem – flowers and celery –microscope to see the xylem) <i>Pattern Seeking:</i> What factors affect plant growth? (Cress seeds in different amounts of light) <i>Comparative / Fair Test:</i> What do plants grow best in? (Comparing soil, sand, cotton wool, paper etc – Grass seeds and cress seeds) Trail <i>Pattern Seeking:</i> Designing a seed to fly far from the tree?</p> </div> <div data-bbox="2463 1812 2893 1948" style="border: 1px solid black; padding: 5px;"> <p>Science Trail Science Trail-Plant reproduction/Plant Diversity</p> </div>

Biology: Animals, Including Humans

Digestive System - Teeth - Food Chains

- 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.

*digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, teeth, incisor, canine, molar, premolar, herbivore, carnivore, omnivore
producer, predator, prey, food chain*

Scientific Enquiry

Research: How does the human digestive system work?

Comparative / Fair Test: How do different liquids affect teeth?

Identify and Classify: Which teeth belong to carnivores, omnivores and herbivores?

Identify and Classify: Which animals are predators and prey?

Science Trail

What food chains exist in our local environment?

Physics: Electricity

Electrical Appliances - Simple Circuits - Switches - Conductors & Insulators

- 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.

electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal

Scientific Enquiry

Identify and Classify: Which objects require electricity? Which uses mains or battery power?

Pattern Seeking: When does a bulb in a circuit light?

Comparative / Fair Test: Does having a greater number of bulbs in a circuit affect the brightness of the bulbs?

Identify and Classify: Which materials are electrical conductors?

Science Trail

What electrical objects are there around us?

Biology: Living Things and Their Habitats

Grouping - Classification Keys - Changing Environments

- 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.

organism, animal, plant, vertebrate, invertebrate, mammal, amphibian, bird, insect, fish, environment, habitat, migrate, hibernate, human impact, positive, negative

Scientific Enquiry

Identify and Classify: How can living organisms be grouped using Venn diagrams, Carroll diagrams and classification keys?

Research: How can environments change, including through human impact?

Science Trail

How can we group living things in our local environment?

Physics: Sound

Vibration - Pitch - Volume

- 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.

sound, source, vibrate, vibration, travel medium, solid, liquid, gas, amplitude, volume, loud, quiet, insulation, decibels, frequency, pitch, high, low, hertz

Scientific Enquiry

Pattern Seeking: How can sounds be made? How can you change their volume and pitch?

Pattern Seeking: Do sounds travel better through solids, liquids or gases?

Comparative / Fair Test: How does volume change over distance?

Pattern Seeking: How do you make sounds of different pitch?

Science Trail

What sounds can you hear in the local environment and what is their volume / pitch?

Chemistry: States of Matter

States of Matter - Changing States - Water Cycle

- 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.

state of matter, solid, liquid, gas, change, melt/melting, freeze/freezing, boiling, evaporate/evaporating, condensate/condensating temperature, heating, cooling, water cycle, evaporation, condensation, precipitation, transpiration

Scientific Enquiry

Identify and Classify: What state of matter are these objects?

Pattern Seeking: How do materials change state?

Comparative / Fair Test: Which type of chocolate changes state the quickest?

Observing Over Time: What happens to puddles?

Science Trail

What states of matter can we see around us?

<p>UKS2 Working Scientifically</p>	<p>Plan</p> <ul style="list-style-type: none"> Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. 		<p>Do</p> <ul style="list-style-type: none"> Take measurements, using a range of scientific equipment, with increasing accuracy and precision, take repeat readings when appropriate. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. 	<p>Review</p> <ul style="list-style-type: none"> Use test results to make predictions to set up further comparative and fair tests. Report and present 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. Identify scientific evidence that has been used to support or refute ideas or arguments. 	
<p>Year 5</p>	<p>Physics: Forces Gravity - Resistance - Mechanisms</p> <ul style="list-style-type: none"> 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. <p><i>force, newtons, gravity, friction, air resistance, upthrust, balanced, unbalanced, gear, lever, pulley, planet, contact, non-contact, drag, thrust, lift, opposite, weight, mass, acceleration, deceleration</i></p> <div data-bbox="178 1092 608 1869" style="border: 1px solid black; padding: 5px;"> <p>Scientific Enquiry <i>Comparative / Fair Test:</i> What shape would be best for a sensor that you want to fall to the bottom of the ocean? Different shaped plasticine shapes –time the fall – could change liquid and look at viscosity. <i>Comparative / Fair Test:</i> Which surface gives the greatest friction? Measuring the angle of the slope that will make an object move. Best grip for shoes. <i>Pattern Seeking:</i> What is the best design for a rocket? Changing nose cone shapes and investigating effect on distance travelled. <i>Pattern Seeking:</i> Which boat shape or sail shape would reduce friction forces the most?</p> <p>Science Trail Forces in Action</p> </div>	<p>Physics: Earth and Space Solar System - Planetary Movement - Day / Night</p> <ul style="list-style-type: none"> 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. <p><i>gravity, star, planet, hemisphere, attract, attraction, weight, moon, orbit, revolve, rotation, axis, equator, season, winter, autumn, mass, solar system, geocentric, heliocentric, sphere, ellipse phases, shadow, temperature, distance</i></p> <div data-bbox="638 1165 1068 1806" style="border: 1px solid black; padding: 5px;"> <p>Scientific Enquiry <i>Pattern Seeking:</i> Investigating trends in planetary data eg. Size vs distance from the Sun or Temperature vs. Distance from the Sun. <i>Observing Over Time:</i> How does the Moon appear to change over a month? – keep a moon diary. Investigating the movement of the Sun in the Sky. (Ping pong ball on a stick) <i>Observing Over Time:</i> Investigating shadows over a day. <i>Research:</i> Investigating the link between mass and weight on Earth – comparing with other places in space.</p> <p>Science Trail Sky at Night</p> </div>	<p>Chemistry: Properties and Changes of Materials Material Properties - Dissolving - Separating Materials - Reversible / Irreversible</p> <ul style="list-style-type: none"> 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. <p><i>property, transparent, opaque, soluble, insoluble, solute, solution, solvent, conduct, insulate, thermal, magnetic, filter, filtrate, evaporate, gas, solid, liquid, distillation, chromatography, state, burning, oxygen, particles</i></p> <div data-bbox="1098 1092 1988 1701" style="border: 1px solid black; padding: 5px;"> <p>Scientific Enquiry <i>Comparative / Fair Test:</i> Which material is the hardest? (Scratch testing with iron nail and magnifying glass) <i>Comparative / Fair Test:</i> Which material dissolves best in water? (comparing the time for salt, sugar, flour, washing powder to dissolve) <i>Comparative / Fair Test:</i> What factors affect how quickly a solid dissolves? (Different sized particles of sugar/ different temperatures) <i>Comparative / Fair Test:</i> What happens to the transparency of a material as it gets thicker? (data logger to measure light intensity with increasing layers) <i>Comparative / Fair Test:</i> Which material is the best thermal insulator? (Hot Chocolate/Penguins investigation) <i>Comparative / Fair Test:</i> Which material is most magnetic? (Measure the distance in mm that a material can move towards a magnet before it experiences a force)</p> <p>Science Trail Water in our World</p> </div>	<p>Biology: Living Things and Their Habitats Life Cycles - Reproduction</p> <ul style="list-style-type: none"> 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. <p><i>bird, fish, amphibian, reptile, birth, mammal, invertebrate, carnivore, herbivore, omnivore, life cycle, prey, reproduction, movement, growth, respiration, sensitivity, nutrition, gestation, fertilisation, germination, pollination, seed dispersal, predator</i></p> <div data-bbox="2018 997 2433 1291" style="border: 1px solid black; padding: 5px;"> <p>Scientific Enquiry <i>Research:</i> Investigating the stages in a sunflower's life. <i>Pattern Seeking:</i> Comparing sexual and asexual reproduction in plants and animals. <i>Pattern Seeking:</i> Investigating seed dispersal.</p> </div> <div data-bbox="2018 1302 2433 1491" style="border: 1px solid black; padding: 5px;"> <p>Science Trail Revisiting tree identifications, seasonal changes and watching the life cycles of living things in action. Habitat Estate Agents.</p> </div>	<p>Biology: Animals, Including Humans <small>Close links to PSHE</small> Life Cycles - Changes</p> <ul style="list-style-type: none"> Describe the changes as humans develop to old age. Understand that all living things have life cycles. <p><i>puberty, life cycle, gestation, womb, growth, baby, asexual reproduction, reproduce, sperm, sexual reproduction, egg, foetus, birth, fertilisation</i></p> <div data-bbox="2478 850 2908 1291" style="border: 1px solid black; padding: 5px;"> <p>Scientific Enquiry <i>Observing Over Time:</i> How does the average height of a class change as they get older? <i>Research:</i> How does a baby's size change over time? <i>Research:</i> How are different animals born? Video based investigation – observations recorded, research to find out extra details, compare and contrast exercises, conclusions written.</p> </div> <div data-bbox="2478 1302 2908 1449" style="border: 1px solid black; padding: 5px;"> <p>Science Trail Observe around Christchurch changes of movement patterns and posture as humans age.</p> </div>

Physics: Light

Sight - Light Travel - Shadows

- Recognise that light appears to travel in straight lines.
- Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye.
- 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.

reflect, reflection, shadow, light, ray, transmit, opaque, transparent, emit, translucent, absorb, dispersion, iris, prism, pupil, retina, optic nerve, lens, image, cornea, refraction, mirror, convex, concave

Scientific Enquiry

Pattern Seeking: Investigating plane mirrors – ray diagrams
Investigating curved mirrors – making careful observations
Comparative / Fair Test: What is the relationship between the distance from the object to the shadow and the size of the shadow? Data collection and line graph analysis
Comparative / Fair Test: Is it easier for light to travel through a thin transparent material or a thick one?

Pattern Seeking: Investigating lenses and magnification
Investigate the dispersion of light through a prism.

Science Trail

Investigating light levels in the school/local environment – identifying sources. Data collection and bar graph analysis.

Physics: Electricity

Circuits - Components - Symbols

- Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.
- 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.

conductor, insulator, battery, cell, lamp, switch, circuit, component, buzzer, motor, voltage, function, brightness, volume, symbols, wire, graphite, series, parallel. plastic, metal

Scientific Enquiry

Research: Constructing circuits and drawing circuit diagrams.
Pattern Seeking: Comparing series and parallel circuits.
Comparative / Fair Test: How does voltage (number of batteries) affect the brightness of lamps?
Comparative / Fair Test: How does voltage (number of batteries) affect the volume of a buzzer?
Comparative / Fair Test: Fruity batteries – measuring voltage to find which fruit makes the best battery.

Science Trail

Electricity in the environment.

Biology: Living Things and Their Habitats

Classification - Microorganisms, Plants and Animals

- Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals.
- Give reasons for classifying plants and animals based on specific characteristics.

mammal, reptile, amphibians adapt, habitat, microorganism, adaptation, characteristics, classify, fungi, virus, bacteria, movement, respiration, reproduction, growth, nutrition, excretion, sensitivity, vertebrate, invertebrates, species, kingdoms, mosses, ferns, woody, flowering plants, non-woody flowering plants

Scientific Enquiry

Identify and Classify: How many groups can plants be organised into and what are their characteristics? Children investigate plant samples provided. How many groups can animals be organised into and what are their characteristics? Children use images of a variety of animals.
Research: Modelling microorganisms - children create plasticine models of magnified bacteria, virus' and fungi – create fact files about each one they make, then work collaboratively to group and compare.

Science Trail

Investigating a habitat – field trip – what plants and animals can be found and how they depend on each other. (Pond dipping/bug hunt)

Biology: Evolution and Inheritance

Evolution - Offspring - Adaptation

- Recognise that living things have changed over time and that fossils provide information about living 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.

natural selection, characteristics, evidence, fossils, parent, offspring, inherit, inherited characteristic, environmental characteristic, adapt, adaptation, evolve, environment, species, breed

Scientific Enquiry

Pattern Seeking: Investigating variation in the classroom – height, weight, hair colour, shoe size etc
Data collection and graph drawing to analyse.
Identify and Classify: What differences are environmental and what differences are inherited from our parents? Children can bring in family photos to make comparisons or you can provide a set of family photos.
Identify and Classify: How are birds adapted to survive on their island? Investigation to replicate the work of Darwin in the Galapagos Islands using various size tweezers to pick up various foodstuffs – small and large nuts, worms and large fruit. Making fossils – how are they made?
Research: Comparing skeletons of humans, with Neanderthals and apes. Using images to observe similarities and differences.

Science Trail

Thinking about birds.

Biology: Animals, Including Humans

Circulatory System - Diet and Lifestyle - Nutrients

- Identify and name the main parts of the human circulatory system, and describe the functions of the 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.

circulatory system, heart, blood vessel, veins, capillaries, lungs, oxygenated, deoxygenated, respiration, pulse, ventricle, aorta, atrium, arteries, oxygen, carbon dioxide

Scientific Enquiry

Pattern Seeking: Investigating nutrition content using food labels – Which is the unhealthiest chocolate bar/snack? How healthy are ready meals?
Comparative / Fair Test: Investigating the effect of exercise on our heart rate.
Research: How does water travel around our body?
Pattern Seeking: How do muscles work? Modelling with paper tubes and rubber bands – investigating muscles in different movements.

Science Trail

Residential - monitor heart rate over different activities.