SCIENCE in a Nutshell

EYFS – Sparrows

Both Years	Autumn	Spring	Summer
EYFS	• Explore the natural world around them, making observations and drawing pictures of animals and plants. • Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.		
Never forgets Knowledge Substantive knowledge	• I know some similarities and differences between the natural world around them and contrasting environments • I know about the changes between seasons • I know the names of common animals and plants		
Never forgets Skills Disciplinary knowledge	• I can explore the natural world around me • I can make observations of animals and plants. • I can understand some important processes and changes in the world around me		
Vocabulary	Seasons, winter, summer, hot, cold, animals, trees, flowers, changes.		

SCIENCE in a Nutshell

Key Stage 1 – Skylarks and Willows

Odd Year	Autumn	Spring	Summer
Unit title	Animals including humans (Y1)	Animals including humans (Y2)	Living things and their habitats (Y2)
	Seasonal Changes – focus on weather and day length		
Concept	Biology	Biology	Biology
Never forgets Knowledge Substantive knowledge	• I know a variety of common animals including fish, amphibians, reptiles, birds and mammals and I can identify some which are carnivores, omnivores and herbivores. • I know the basic parts of the human body and can identify, name, draw and label them and say which part of the body is associated with each sense.	• I know that animals, including humans, have offspring which grow into adults. • I know that animals have basic needs for survival. • I know that humans need the right types of foods, exercise and hygiene.	• I know differences between things that are living, dead, and things that have never been alive. • I know 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.
	• Observe changes across the four seasons. • Observe and describe weather associated with the seasons and how day length varies.		
Never forgets Skills Disciplinary knowledge	• I can describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets).	• I can research and describe the basic needs of animals, including humans, for survival (water, food and air). • I can make simple measurements, for example, timing activities relating to exercise.	• I can identify and name a variety of plants and animals in their habitats, including micro-habitats. • I can 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.
	• I know that the day length varies with the seasons and I can describe why this happens in terms of the tilt and orbit of the Earth with some support. • I can make observations and simple measurements associated with the weather, for example types of cloud, rainfall, temperature. • I can display my findings using simple data handling techniques. • I can compare the weather across the seasons.		
Vocabulary	Head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves, senses,touch, see, smell, taste, hear, fingers (skin), eyes, nose, ear and tongue, animal names, parts of the body.	Offspring, reproduction, growth, child, young/old stages (examples - chick/hen, baby/child/adult, caterpillar/butterfly), exercise, heartbeat, breathing, hygiene, germs, disease, food types (examples – meat, fish, vegetables, bread, rice, pasta)	Living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed, names of local habitats e.g. pond, woodland etc., names of micro-habitats e.g. under logs, in bushes etc
	• Weather (sunny, rainy, windy, snowy etc.), temperature, seasons (winter, summer, spring, autumn), sun, sunrise, sunset, day length		

SCIENCE in a Nutshell

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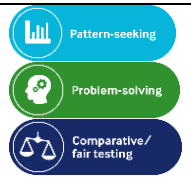
	Seasonal Changes 		

SCIENCE in a Nutshell

Key Stage 1 – Skylarks and Willows

Even Year	Autumn	Spring	Summer	
Unit title	Everyday Materials (Yr1)	Uses of Materials (Yr2)	Plants (Yr1 and 2)	
	Seasonal Changes (Y1) biology – focus on plants and animals.			
Concept	Physics	Physics	Biology	
Never forgets Knowledge Substantive knowledge	• I know a variety of everyday materials. • I know that all objects are made with one or more material/s. • I know that some materials can be in different forms, with different properties.	• I know how the shapes of objects can be changed. • I know when you chose to make something the properties of the material used need to be suitable.	• I know a variety of common wild and garden plants. • I know the difference between deciduous and evergreen trees. • I know plants have key characteristics.	• I know how seeds and bulbs grow into mature plants. • I know plants grow from a seed or bulb. • I know seeds and bulbs need to be planted at certain times of the year and they will geminate at different rates. • I know plants need different amounts of water and space to grow.
	• I know some plants look different across the seasons. • I know some animals change across the seasons. • I know the changes in weather has effects on animals and plants (For example on the number of mini beasts found outside or the plant growth).			
Never forgets Skills Disciplinary knowledge	• I can distinguish between an object and material from which it is made. • I can describe physical properties of a variety of everyday materials. • I can compare and group together everyday materials. • I can label and a picture or diagram of an object made from different materials.	• I can identify and compare the suitability of a variety of everyday materials. • I can make links between materials properties and their particular use. • I can identify what properties a suitable material needs to have for a particular purpose.	• I can describe the basic structure of a variety of common flowering plants and trees. • I can describe the key features of trees and plants. • I can identify trees that have lost or kept their leaves the whole year.	• I can describe what plants need to stay healthy. • I can describe how plants have grown from seeds and bulbs. • I can identify plants that have grown well in different conditions.
	• I can make observation across the four seasons. • I can name the four seasons. • I can describe how the weather effects animals and plants			

SCIENCE in a Nutshell

Vocabulary	Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see-through, not see-through.	Names of materials – wood, metal, plastic, glass, brick, rock, paper, cardboard Properties of materials – as for Year 1 plus opaque, transparent and translucent, reflective, non-reflective, flexible, rigid Shape, push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching.	Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud Names of trees in the local area Names of garden and wild flowering plants in the local area.	As well as year 1 words: light, shade, sun, warm, cool, water, grow, healthy.
	Seasons, winter, summer, spring, autumn, hot, cold, animals, trees, flowers, changes, evergreen, leaves.			
Enquiry Types Enquiry Types KS1.docx				
	Seasonal Changes 			

SCIENCE in a Nutshell

Lower Key Stage 2 – Swifts and Sycamores

Odd Year	Autumn		Spring		Summer
Unit title	Plants (Yr3)	Animals including Humans (Yr3)	Animals including Humans (Y4)	Living Things and Their Habitats (Y4)	Electricity (Yr4)
Concept	Biology	Biology	Biology	Biology	Physics
Never forgets Knowledge Substantive knowledge	• I know the major structures of flowing plants and their functions. • I know the requirements of plants for life and growth • I understand the part that flowers play in the life cycle of flowering plants	• I know that animals including humans need the right types of nutrition. • I know that animals including humans have skeletons for support, protection and movement.	• I know the simple functions of the basic parts of the digestive system in humans. • I know the different types of teeth in humans and their simple functions. • I know how producers, predators and prey relate in a food chain.	• I know that living things can be grouped in a variety of ways. • I know that environments can change and that this can sometimes pose dangers to living things.	• I know common appliances that run on electricity. • I know that an electrical system must be set up in a circuit in order to work. • I know that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. • I know what conductor and insulator mean and I know that metals conduct electricity.
Never forgets Skills Disciplinary knowledge	• I can identify and describe the functions of different parts of flowering plants • I can investigate the way in which water is • transported within plants. • I can conduct a comparative test.	• I can name some parts of the skeleton and describe their function. • I can make a simple model of bones and muscles and describe what it shows. • I can describe a healthy diet involving the major food groups.	• I can construct and interpret a variety of food chains and webs, identifying producers, predators and prey. • I can conduct a simple comparative test relating to the damage different liquids can do to teeth.	• I can use and create classification keys to help group, identify and name a variety of living things in their local and wider environment. • I can present my learning about the environment in a variety of ways.	• I can construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. • I can identify whether or not a lamp will light in a simple series circuit. • I can conduct a comparative test to identify conductors and insulators. • I can make and use a switch in a circuit.
Vocabulary	Photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersal)	Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, joints, support, protect, move, skull, ribs, spine	Digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, teeth, incisor, canine, molar, premolars, herbivore, carnivore, omnivore, producer, predator, prey, food chain	Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate	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, symbol

SCIENCE in a Nutshell

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SCIENCE in a Nutshell

Lower Key Stage 2 – Swifts and Sycamores

Even Year	Autumn		Spring	Summer	
Unit title	Forces and Magnets (Yr3)	Light (Yr3)	Rocks (Yr3)	States of Matter (Yr4)	Sound (Yr4)
Concept	Physics		Chemistry	Chemistry	Physics
Never forgets Knowledge Substantive knowledge	• I know that some forces need contact between two objects, but magnetic force can act as a distance. • I know some materials are attracted to magnets and other repel. • I know magnets have two poles. • I know a force is a push or a pull.	• I know that light in needed in order to see things. • I know that dark is the absence of light. • I know that light can be reflected from some surfaces. • I know the dangers of sunlight and ways to protect our eyes. • I know that shadows are formed when the light from a light source is blocked by an opaque object. • I know the size of a shadow depends on the position of the source, object and surface.	• I know how a fossil is formed when things that have lived are trapped within rock. • I know that rock is a naturally occurring material. • I know there are different types of rocks, which have different properties. • I know some rocks can absorb water. • I know some rocks contain fossils.	• I know that temperatures are measured in degrees. • I know that some materials change state when they are heated or cooled. • I know the part evaporation and condensation plan in the water cycle. • I know the rate of evaporation changes with temperature. • I know a solid keeps it shape and has a fixed volume. • I know a liquid has a fixed volume but changes shape to fit the container. • I know gas fills all available space and it has no fixed shape or volume.	• I know how sounds are made. • I know that vibrations from sounds travel through a medium to the ear. • I know that sounds get fainter as the distance from the sound increases. • I know that sound can travel through different mediums, but sound cannot travel through a vacuum. • I know a sound insulator blocks the sound.

SCIENCE in a Nutshell

Never forgets Skills Disciplinary knowledge	• I can compare how things move on different surfaces. • I can make predictions, observations and record findings. • I can give examples of forces in everyday life. • I can draw diagrams to show attraction and repulsion between poles of magnets. • I can predict, make observation and recordings.	• I can explore how the size of shadows change. • I can name different light sources. • I can define transparent, translucent and opaque. • I can describe how shadow are formed. • I can predict, make observation and record these.	• I can compare and group together different kinds of rocks based on their appearance and simple physical properties. • I can recognise that soils are made from rocks and organic matter. • I can explain what organic matter is. • I can name some rocks and their physical features. • I can explain how a fossil is formed.	• I can compare and group materials together, according to whether they are solids, liquids or gases. • I can make predictions, observations and record my findings. • I can explain the water cycle. • I can describe the different state changes. • I can name properties of solids, liquids and gases. • I can give everyday examples of evaporation and condensation.	• I can find patterns between the pitch of a sound and the features of the object that produced it. • I can find patterns between the volume of a sound and the strength of the vibrations that produce it. • I can name some sound sources. • I can give examples of how to change the volume of a sound. • I can predict and record findings.
Vocabulary	Force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, attract, repel, metal, iron, steel, poles, north pole, south pole.	Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous.	Rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, soil, fossil, marble, chalk, granite, sandstone, slate, soil, peat, sandy/chalk/clay soil, igneous, metamorphic, sedimentary.	Solid, liquid, gas, state change, melting, freezing, melting point, boiling point, evaporation, condensation, temperature, water cycle.	Sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation, distance.
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SCIENCE in a Nutshell

Upper Key Stage 2 – Swallows and Oaks

Odd Year	Autumn		Spring		Summer
Unit title	Forces Y5	Earth and Space Y5	Animals including Humans Y5	Animals including Humans Y6	Evolution and inheritance Y6
Concept	Physics	Physics	Biology	Biology	Biology
Never forgets Knowledge Substantive knowledge	• I know that forces cause objects to change speed and/or direction. • I know that gravity is a force which pulls objects towards the centre of the Earth. • I know that forces can be contact or non-contact. • I understand how some simple mechanisms work.	• I know that the Earth is one of eight planets in our Solar System orbiting the Sun (which is a star). • I know that all objects in the Solar System rotate and all are orbiting another body. •	• I can explain the changes as humans grow to old age.	• I understand the main functions of the human circulatory system. • I can describe how water and nutrients are transported in the body. • I can recognise the impact of diet, exercise and drugs on the way bodies function.	• I know that living things are adapted to suit their environments. • I know that living things can change over time (evolve) and these changes can be seen in the fossil record. • I know that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.
Never forgets Skills Disciplinary knowledge	• I can make a simple mechanism. • I can make accurate measurements of time and distance. • I can show my results using a line graph.	• I can research information about the planets. • I can explain day and night, the phases of the Moon and the apparent movement of the Sun through my understanding of orbits, rotation and the relative position of the bodies.	• I can describe the changes that takes place in boys and girls during puberty • I can describe how a baby changes physically as it grows, and also what it is • able to do	• I can take accurate measurements of changes in the body, for example, by recording a pulse rate. • I can display information in a way that is easily understood by others (eg pie chart, poster).	• I can research information about scientists and about fossils. • I can make observations about adaptations in living things. • I can demonstrate the process of natural selection eg through 'finch's beak' activity.
Vocabulary	Force, gravity, Earth, mass, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears	Earth, Sun, Moon, (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune), spherical, solar system, rotates, star, orbit, planets	Puberty, growth, fertilisation, gestation, life cycle, reproduce, sexual, asexual.	Heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, nutrients, water, muscles, cycle, circulatory system, diet, exercise, drugs, lifestyle	Offspring, sexual reproduction, vary, characteristics, suited, adapted, environment, inherited, species, fossils

SCIENCE in a Nutshell

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				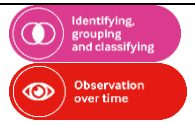	

Upper Key Stage 2 – Swallows and Oaks

Even Year	Autumn		Spring	Summer	
Unit title	Light (Y6)	Electricity (Y6)	Properties and Changes of Materials (Y5)	Living Things and Their Habitats (Y5)	Living Things and Their Habitats (Y6)
Concept	Physics		Chemistry	Biology	
Never forgets Knowledge Substantive knowledge	• I know that light travels in straight lines. • I know that we see things because light travels from light sources to our eyes. • I know that we can see objects when light travels from a light source to objects and reflected to our eyes. • I know that objects that do not need to be fully transparent block light.	• I know that the number of voltage cells effects the volume of the buzzer and brightness of the bulbs. • I know that turning a switch off breaks the circuit.	• I know that some materials will dissolve in a liquid and form a solution. • I know that there is a difference between reversible and irreversible changes. • I know materials have different uses depending on their properties and state.	• I know the life process of reproduction in some plants and animals. • I know animals, including humans have offspring. • I know what metamorphosis is. • I know the difference between sexual and asexual reproduction.	• I know plants and animals are classified based on specific characteristics. • I know plants can make their own food, whereas animals can't. • I know not all living things can fit into two main groups (plants and animals) for example micro-organisms. • I know animals can be separated into 2 main groups (vertebrate and invertebrates). • I know plants can be divided broadly into flowing and not-flowering.

SCIENCE in a Nutshell

Never forgets Skills Disciplinary knowledge	• I can predict and explain why shadows have the same shape as the objects that cast them. • I can use diagrams to explain how light travels. • I can make predictions, observations and record findings.	• I can recognise the different electrical symbols and draw these. • I can compare and give reasons for variations in how components in an electrical circuit function. • I can make an electrical circuit. • I can make predictions, observations and record findings.	• I can compare and group together everyday materials. • I can separate mixtures through filtering, sieving and evaporating. • I can explain what dissolving means. • I can make predictions, observations and record findings.	• I can describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. • I can tell the difference between asexual and sexual plant. • I can draw the life cycle of an animal.	• I can describe how living things are classified into broad groups. • I can observe differences and similarities between micro-organisms, plants and animals. • I can give examples of animals in the 5 vertebrate groups. • I can compare the characteristics of animals in different groups.
Vocabulary	Light, straight lines, light rays, eyes, light source, dark, absence of light, shadow, reflect, transparent.	Circuit, diagram, symbol, cell, battery, bulb, buzzer, motor, switch, voltage.	Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, rusting, new material.	Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, bulbs, cuttings.	Vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, insects, spiders, snails, worms, flowering, non-flowering.
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