ST JAMES
C.E. PRIMARY SCHOOL
DREAM • BELIEVE • LEARN • ACHIEVE

Science Overview

All Years

Cycle A	Autumn		Spring		Summer
KS1	Seasonal Changes (Autumn and Winter)	Everyday materials	Animals Including Humans (Long unit)	Seasonal Changes (Spring and Summer)	Plants
LKS2	Rocks	Animals including Humans	Light	Forces and Magnets	Plants
UKS2	Light	Animals including Humans	Evolution and Inheritance	Electricity	Living things and their habitats

Cycle B	Autumn		Spring		Summer
KS1	All living things and their habitats	Uses of Everyday Materials	Animals Including Humans		Plants
LKS2	Animals including Humans	States of Matter	Electricity	Sound	Living things and their habitats
UKS2	Earth and Space	Living things and their habitats	Properties and changes of materials	Forces	Animals, including humans

New Science Curriculum – KS1 – Cycle B (Y2 Objectives)

KS1 WS Vocabulary	Working Scientifically (WS)	Ways of Working Scientifically
Observe Compare Classify Equipment Test Enquire	During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: • asking simple questions and recognising that they can be answered in different ways • observing closely, using simple equipment • performing simple tests • identifying and classifying • using their observations and ideas to suggest answers to questions • gathering and recording data to help in answering questions. Non-Statutory • Pupils in years 1 and 2 should explore the world around them and raise their own questions. • They should experience different types of scientific enquiries, including practical activities, and begin to recognise ways in which they might answer scientific questions. • They should use simple features to compare objects, materials and living things and, with help, decide how to sort and group them, observe changes over time, and, with guidance, they should begin to notice patterns and relationships. • They should ask people questions and use simple secondary sources to find answers. • They should use simple measurements and equipment (for example, hand lenses, egg timers) to gather data, carry out simple tests, record simple data, and talk about what they have found out and how they found it out. • With help, they should record and communicate their findings in a range of ways and begin to use simple scientific language. These opportunities for working scientifically should be provided across years 1 and 2 so that the expectations in the programme of study can be met by the end of year 2. Pupils are not expected to cover each aspect for every area of study.	• Observing changes over time • Looking for naturally occurring patterns or relationships • Identifying, classifying and grouping • Researching using secondary sources • Comparative and fair testing • Making things and developing systems • Investigating models

Vocabulary	All Living Things and Their Habitats		WS – Investigations and Skills
Tier 2 Survive Need Tier 3 Living Dead Habitat Micro-Habitat Food Chain Healthy Additional Woodland Desert Pond Ocean Rainforest Extinct Endangered Mountain Consumer Producer	Statutory Knowledge and Understanding Objectives • I can explore and compare the differences between things that are living, dead, and things that have never been alive (1) • I can identify and name a variety of plants and animals in their habitats, including micro-habitats (2) • I can 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 (3) • 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. (4 and 5) Non-Statutory • Pupils should be introduced to the idea that all living things have certain characteristics that are essential for keeping them alive and healthy. • They should raise and answer questions that help them to become familiar with the life processes that are common to all living things. Pupils should be introduced to the terms 'habitat' (a natural environment or home of a variety of plants and animals) and 'micro-habitat' (a very small habitat, for example for woodlice under stones, logs or leaf litter). • They should raise and answer questions about the local environment that help them to identify and study a variety of plants and animals within their habitat and observe how living things depend on each other, for example, plants serving as a source of food and shelter for animals. • Pupils should compare animals in familiar habitats with animals found in less familiar habitats, for example, on the seashore, in woodland, in the ocean, in the rainforest.	Sequence of Lessons and Intended Knowledge (ESSENTIAL KNOWLEDGE) Note: check plants topic for observations of habitats and plants through the year. **Revisit (Y1)** Animal types – mammal, bird, fish, amphibian, reptile/ carnivore, herbivore, omnivore. What is a habitat? Know that animals including humans need shelter, water, oxygen, food and sleep to survive. 1. **Identify things that are living, dead or have never lived.** Understand that things that have never been alive are objects that do not or have not breathed, grown or reproduced. 2. **Identify different types of habitats and the animals that live there** Identify different habitats Observe the local environment to identify animals and plants. Understand that a habitat is a natural home or environment (desert, ocean, rainforest, arctic, savannah, underground) for a living thing A micro-habitat is a smaller habitat within a larger one e.g. a flower bed in a garden, a tree within a forest. Appreciate the dangers to ocean life Appreciate that environments are constantly changing Describe different habitats e.g. it is cold and icy in the arctic, it is sandy and hot I the desert. 3. **Know that living things live in environments to which they are suited**	• Question - Ask/answer questions • Classify – living, dead and never alive • Compare – animals from different habitats • Observe – Habitats • Identify – Plants in the local area • Research – Use of secondary sources to find information **Links to Writing** • Advert for an animal habitat • Recipe for a particular animal's meal **Links to Maths** • Counting • Sorting/ Tables and Charts
Scientists Rachel Carson			

	• Pupils might work scientifically by: sorting and classifying things according to whether they are living, dead or were never alive, and recording their findings using charts. • They should describe how they decided where to place things, exploring questions for example: 'Is a flame alive? Is a deciduous tree dead in winter?' and talk about ways of answering their questions. • They could construct a simple food chain that includes humans (e.g. grass, cow, human). They could describe the conditions in different habitats and micro-habitats (under log, on stony path, under bushes) and find out how the conditions affect the number and type(s) of plants and animals that live there.	Know that animals live in different habitats and be able to match animals to the habitat in which they live. Match plants to their habitat Understand why some animals are more suited to their habitat than others Understand that living things depend on their environment **4. Describe how animals obtain food** Name different sources of food Know the food that comes from different plants and animals Know that animals who eat other animals are predators and animals that are eaten by another animal are called prey. **5. Create simple food chains** Create simple food chains including humans Know that a food chain shows who eats what in a habitat Know that the arrows in a food chain show the flow of energy. Know that food chains start with a plant (producer) **Extension (Y2)** Design a manmade habitat for a real-life animal or their own imagined animal. Explain why they have chosen this habitat. Time permitting create models of these habitats.	

Vocabulary	Uses of Everyday Materials		WS – Investigations and Skills
<u>Tier 2</u> Everyday Suitable <u>Tier 3</u> Material Squash Bend Twist Stretch Property <u>Additional</u> Absorbent Waterproof Force Strong Weak Natural Manmade	Statutory Knowledge and Understanding Objectives • I can identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses (1, 2 and 3) • I can find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (4 and 5) Non-Statutory • Pupils should identify and discuss the uses of different everyday materials so that they become familiar with how some materials are used for more than one thing (metal can be used for coins, cans, cars and table legs; wood can be used for matches, floors, and telegraph poles) or different materials are used for the same thing (spoons can be made from plastic, wood, metal, but not normally from glass). • They should think about the properties of materials that make them suitable or unsuitable for particular purposes and they should be encouraged to think about unusual and creative uses for everyday materials. • Pupils might find out about people who have developed useful new materials, for example John Dunlop, Charles Macintosh or John McAdam. • Pupils might work scientifically by: comparing the uses of everyday materials in and around the school with materials found in other places (at home, the journey to school, on visits, and in stories, rhymes and songs); observing closely, identifying and classifying the uses of different materials, and recording their observations.	Sequence of Lessons and Intended Knowledge (ESSENTIAL KNOWLEDGE) <u>**Revisit (Y1)**</u> Recognise everyday materials and some purposes they have Identify natural and manmade Learn vocabulary to describe materials which relate to properties 1. **Learn the properties of materials that made them suitable or unsuitable for a particular purpose** Name the material in which everyday objects are made from e.g. window/glass, door/wood, chair & toys/plastic, clothing/fabric, cutlery/metal, books/paper, box/cardboard, house/bricks. Identify the properties of materials e.g. glass is transparent and waterproof, metal is strong and opaque. Understand that some materials can have different uses Know that some materials are better suited to a use than others 2. **Compare the used of everyday materials** Compare uses in and around your school or home with materials found in other places 3. **Investigate our own questions about uses of materials** Record findings from experiment to say which material is most suitable 4. **Investigate squashing, bending, twisting and stretching** Explore how the shapes of objects can be changed by squashing, bending, twisting and stretching (a	• Question – Ask/answer questions • Identify – Different materials • Identify – How materials are used, and some objects can be made from different materials • Classify – Objects • Simple test – how we can change shapes of some solid objects • Simple test – Identify and Compare - suitability of materials for an object e.g. 3 Little Pigs House, Coat, Umbrella or Cup **Links to Writing** • Non-chronological report – uses of different materials • Letter – suggest to companies how they can use materials other than plastic and what they can use instead **Links to Maths** • Counting • Sorting/Tables • Shape – use of shape language for properties of objects
Scientists - Charles Macintosh -John Dunlop, -John McAdam			

		sock, a plastic bottle, a sponge, a rubber band, a balloon, a piece of paper). 5. **Explore the word of Charles Macintosh,** Understand how the properties of materials can be changed **<u>Extension (Y2)</u>** Recognise that new materials are constantly being invented – recycling Explore the work of John Dunlop, identify and compare the usefulness of certain materials when forces are applied Know about John McAdam's invention	

Vocabulary	Animals, Including Humans		WS – Investigations and Skills
<u>Tier 2</u> Exercise Hygiene <u>Tier 3</u> Reproduction Baby Toddler Child Teenager Adult <u>Additional</u> Nutrition Diet Water Food Air Disease Infection Vaccine Similarities Differences Generation Young Old	Statutory Knowledge and Understanding Objectives • I can notice that animals, including humans, have offspring which grow into adults (1 and 2) • I can find out about and describe the basic needs of animals, including humans, for survival (water, food and air) (3) • I can describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. (4) Non-Statutory • Pupils should be introduced to the basic needs of animals for survival, as well as the importance of exercise and nutrition for humans. • They should also be introduced to the processes of reproduction and growth in animals. The focus at this stage should be on questions that help pupils to recognise growth; they should not be expected to understand how reproduction occurs. • The following examples might be used: egg, chick, chicken; egg, caterpillar, pupa, butterfly; spawn, tadpole, frog; lamb, sheep. Growing into adults can include reference to baby, toddler, child, teenager, adult. • Pupils might work scientifically by: observing, through video or first-hand observation and measurement, how different animals, including humans, grow; asking questions about what things animals need for survival and what humans need to stay healthy; and suggesting ways to find answers to their questions. Note: refer to Human Development and Reproduction in the Primary Curriculum document for further guidance	Sequence of Lessons and Intended Knowledge (ESSENTIAL KNOWLEDGE) <u>**Revisit (Y1)**</u> Identify the main parts of the human body and the body parts associated with senses Use rhyming and mnemonics to remember the names of body parts Identify where head, shoulders, neck, arms, elbows, hands, legs, knees, face, ears, eyes, hair, mouth and teeth are 1. **Identify offspring of different animals** Know that a baby human grows into an adult human and that the offspring of animals grow into adults. Know the adult and offspring names for the following animals and that they grow into adults; cows (calf), horses (foal), hen (chick), owl (owlet), crocodile (hatchling), dog (puppy), cat (kitten). 2. **Learn the life cycle of birth, growth, reproduction and death** Growing into adults can include reference to baby, toddler, child, teenager, adult. Know the life cycle of a frog and butterfly Look at how tadpoles and caterpillars grow compared to other animals e.g. puppies and kittens 3. **Understand the basic needs of animals including humans** Know that animals including humans need shelter, water, oxygen, food and sleep to survive. 4. **Know how to keep healthy through diet and exercise** Understand the importance of exercise, a healthy diet and hygiene and what is needed for humans to survive	• Question – Ask/answer questions Identify – offspring matched to the parents • Research – secondary sources • Observe – How different animals grow (video/pictures) **Links to Writing** • Imagine you are staying away from home at a family members/friends house. Create a postcard to Essential Knowledge home to explain what you have done that meets your needs (e.g. eaten, exercised, slept). • Stories – The Hungry Caterpillar, Tadpole's Promise **Links to Maths** • Counting • Sorting/Tables
Scientists Louis Pasteur Edward Jenner			

		Begin to understand the five food groups; fruits and vegetables, carbohydrates, fat, protein and dairy Know examples of food from the five food groups. Know a balanced diet includes eating lots of fruit and vegetables and small amounts of fatty foods. Know that exercising is good for our body because it builds muscles, makes our heart beat faster and pumps blood around our body. Know that not living a healthy lifestyle can affect the way we grow. Know how to stay hygienic including washing regularly and brushing our teeth. **Extension (Y2)** Know how diseases are cured and learn about the work of Louis Pasteur Appreciate the word of Edward Jenner, Understand vaccination	

Vocabulary	Plants		WS – Investigations and Skills
<u>Tier 2</u> Temperature Growth <u>Tier 3</u> Nutrient Survival Deciduous Evergreen Germination Reproduction <u>Additional</u> Soil Pollen	Statutory Knowledge and Understanding Objectives • I can observe and describe how seeds and bulbs grow into mature plants • I can find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. Non-Statutory • Pupils should use the local environment throughout the year to observe how different plants grow. • Pupils should be introduced to the requirements of plants for germination, growth and survival, as well as to the processes of reproduction and growth in plants. • **Note:** Seeds and bulbs need water to grow but most do not need light; seeds and bulbs have a store of food inside them. • Pupils might work scientifically by: observing and recording, with some accuracy, the growth of a variety of plants as they change over time from a seed or bulb, or observing similar plants at different stages of growth; setting up a comparative test to show that plants need light and water to stay healthy.	Sequence of Lessons and Intended Knowledge (ESSENTIAL KNOWLEDGE) Note: Beginning of the year – look at the plants in the environment and have plants in the classroom that you can care for during the year. **<u>Revisit (Y1)</u>** Basic parts of a plant What a plant needs to grow 1. **Describe how plants grow and change** Observe changes through time lapse videos Explain own ideas about plant growth Understand plants need water, light and a suitable temperature in order to grow well Understand plants make their own food (no need to go into detail of how at this point) Understand the difference between a bulb and a seed Know that when a seed starts to grow and shoots begin to sprout the seed has germinated 2. **Observe plants in the local environment** Discuss what we have noticed through the year Look at different types of plants 3. **Explore what plants need to thrive** Know that plants need water, light and a suitable temperature to grow well Set up a comparative test to observe plants based on children's ideas about plant growth Measure plants 4. **Explain how to care for a plant**	• Question – Ask/answer questions • Observe – Growth of seeds and bulbs over time • Compare – How seeds and bulbs grow – simple measurement language • Observe – Plants in the local environment and how they change over the year • Simple test – Comparison- water/light/temperature changed for once type of plant. Verbal descriptions or simple measures • Create own greenhouse **Links to Writing** • Instructions – How to care for a plant • Description – the growth of a plant and what happens **Links to Maths** • Counting • Sorting/ Tables • Measurement – size and vocabulary related to this e.g. bigger, smaller, taller, shorter, faster, slower
Scientists Joseph Banks			

		<u>Extension (Y2)</u> Investigate plants around the world and why they are suited to their habitats including carnivorous plants What can they do to encourage people to grow plants? Why are plants so important? Think about the bee population in relation to this.	