Pakeman Primary School

Science Curriculum
EYFS, KS1 and KS2

Pakeman Primary School

Science curriculum
Progression of Knowledge
EYFS, KS1 and KS2

At Pakeman, we have a Year A / Year B cycle of topics. For each Science unit of work, children should be taught the **key knowledge**, **key skills** and **key vocabulary**. As children move through the school, they will build on prior knowledge and skills. Please ensure that this information is fully covered in the series of lessons that you plan. In KS1 and KS2 we follow the Kapow scheme of work. Please note that two learning objectives should be taught on a weekly basis in KS1 and KS2. In EYFS, we use development matters and link our science learning to our class topics through science-related mini themes.

Contents

Science Topic Map EYFS, KS1 and KS2 (Year A / Year B cycle)

The Kapow **units** of work are listed below for KS1 and KS2. In EYFS, we cover science knowledge, skills and vocabulary through our **topics** and science **mini-themes**.

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
2-Plus	**Topic: All About Me** **Mini-theme 1: Family / Facial features / Body parts / Autumn**	**Topic: Nursery Rhymes** **Mini-theme 2: Instruments**	**Topic: Favourite Stories** **Mini-theme 3: Colours & colour mixing / Exploring fruit & animals / Hunts & trails**	**Topic: Transport** **Mini-theme 4: Cardboard box rockets / Wheel track paintings / Paper planes**	**Topic: Down at the Farm** **Mini-theme 5: Animal sounds / Farm small world / Spring**	**Topic: Under the Sea** **Mini-theme 6: Sealife / Boats / Floating and sinking**
Nursery (Year A)	**Topic: Marvellous Me** **Mini-theme 1: Facial features / Body parts / Autumn**	**Topic: Building & Construction** **Mini-theme 2: Different materials for building / Winter**	**Topic: Making Music** **Mini-theme 3: Different instruments / Making instruments / Using everyday objects to make music**	**Topic: Pirates** **Mini-theme 4: Boat making**	**Topic: Shopping** **Mini-theme 5: Spring**	**Topic: Pets** **Mini-theme 6: How to care for pets / Describing pets / Naming pets / Vets / Summer**
Nursery (Year B)	**Topic: Marvellous Me** **Mini-theme 1: Facial features / Body parts / Autumn**	**Topic: Building & Construction** **Mini-theme 2: Different materials for building / Winter**	**Topic: Songs & Rhymes** **Mini-theme 3: Body percussion**	**Topic: Dinosaurs** **Mini-theme 4: Dinosaur names / Excavation play / Dinosaur small-world**	**Topic: People Who Help Us** **Mini-theme 5: Different job roles / Dental care / Fire safety / Spring**	**Topic: On Safari** **Mini-theme 6: Animal names / Animal habitats / Animal features / Summer**
Reception	**Topic: Who Am I?** **Mini-theme 1: Similarities & differences / The senses /Autumn**	**Topic: Bears** **Mini-theme 2: Different types of bears / Habitats / Winter**	**Topic: What We Eat** **Mini-theme 3: Healthy eating / Where food comes from / Cooking**	**Topic: Traditional Tales** **Mini-theme 4: Growing beans**	**Topic: Spring** **Mini-theme 5: Minibeasts / Lifecycles / Spring**	**Topic: Adventures** **Mini-theme 6: Animal adventures / Space adventures**
Year 1 and year 2 (Year A)	**Unit 1: Forces and Space** **Seasonal Changes**	**Unit 2: Materials** **Everyday Materials**	**Unit 3: Materials** **Uses of Everyday Materials**	**Unit 4: Living Things and Their Habitats** **Habitats**	**Unit 5: Living Things and their Habitats** **Microhabitats**	**Unit 6: Making Connections** **Science Through Stories**
Year 1 and year 2 (Year B)	**Unit 1: Animals including Humans** **Sensitive Bodies**	**Unit 2: Animals including Humans** **Comparing Animals**	**Unit 3: Animals including Humans** **Life cycles and health**	**Unit 4: Plants** **Introduction to Plants**	**Unit 5: Plants** **Plant Growth**	**Unit 6: Making connections** **Plant Based Materials**

Year 3 and year 4 (Year A)	**Unit 1: Animals Including Humans** Digestion and Food	**Unit 2: Electricity** Electricity and Circuits	**Unit 3: Sound (4S)** Sounds and Vibrations	**Unit 4: Living things and their habitats (4LvH)** Classification and Changing Habitats	**Unit 5: Materials** States of Matter	**Unit 6: Making connections:** How does the flow of liquids compare?
Year 3 and year 4 (Year B)	**Unit 1: Animals Including Humans (3AH)** Movement and Nutrition	**Unit 2: Light** Light and Shadows	**Unit 3: Forces and Space** Forces and Magnets	**Unit 4: Materials** Rocks and Soil	**Unit 5: Plants** Plant Reproduction	Unit 6: Making Connections Does hand span affect grip strength?
Year 5 and year 6 (Year A)	Unit 1: Forces and space: Unbalanced forces	Unit 2: Living things and Their Habitats: Life cycles and reproduction	**Unit 3: Energy:** Circuits, Batteries and Switches	**Unit 4: Living Things and their Habitats:** Classifying Big & Small	**Unit 5: Living Things and their Habitats:** Evolution and Inheritance	**Unit 6: Making Connections:** Human Timeline
Year 5 and year 6 (Year B)	Unit 1: Animals Including Humans: Circulation and Health	Unit 2: Forces and Space: Earth and Space	Unit 3: Energy: Light and reflection	Unit 4: Materials: Mixtures and Separation	Unit 5: Materials Properties and Changes	Unit 6: Making connections: Does the size of an asteroid affect the diameter of its impact crater?

Pakeman Primary School
Science curriculum – 2 Plus

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topic	**All About Me**	**Nursery Rhymes**	**Favourite Stories**	**Transport**	**Down at the Farm**	**Under the Sea**
Science-related mini themes	**Family Facial features Body parts Autumn**	**Instruments**	**Colours & colour mixing Exploring fruit & animals Hunts & trails**	**Cardboard box rockets Wheel track paintings Paper planes**	**Animal sounds Farm small world Spring**	**Sealife Boats Floating and sinking**
Key skills (Overarching)	*Early science skills are foundational and are developed through play and everyday experiences. Opportunities for children to explore and observe the world around them help build these important scientific skills* • Repeat actions that have an effect • Explore materials with different properties • Explore and respond to different natural phenomena in their setting and on trips • Explore natural materials, indoors and outside					
Key knowledge (Overarching)	*Note: scientific knowledge not specified in Development Matters for this age group. Please ensure that the topic specific knowledge below is taught during each science-related mini theme*					
Key knowledge (Topic specific)	We use our eyes to see, we use our nose to smell, we use our ears to listen. When it is autumn, leaves and conkers fall off the trees.	Different instruments make different sounds. Actions lead to reactions, such as pressing a button to make a sound.	We can mix colours to create new ones. Forests are places that have lots of trees.	Rockets and aeroplanes fly in the sky. Cars and bikes move when the wheels go round.	Different animals make different sounds and have different features. When it is spring it is warmer, and baby animals are born.	Lots of different creatures live in the ocean. Things can float up or sink down.
Key vocabulary	eyes ears nose hands feet leaf tree conker	bang shake blow loud quiet drum shaker whistle	mix mango pineapple juicy zebra elephant bear cave forest river	rocket aeroplane train bike wings wheels round drive fly move	cow pig horse sheep chicken tail fur feather barn pond	shark whale octopus starfish seahorse shell ocean sail float sink

Pakeman Primary School
Science curriculum – Nursery
Year A

Year A	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topic	**Marvellous Me**	**Building & Construction**	**Making Music**	**Pirates**	**Shopping**	**Pets**
Science-related mini themes	**Facial features Body parts Autumn**	**Different materials for building Winter**	**Different instruments Making instruments Using everyday objects to make music**	**Boat making**	**Spring**	**How to care for pets Describing pets Naming pets Vets Summer**
Key skills	*Early science skills are foundational and are developed through play and everyday experiences. Opportunities for children to explore and observe the world around them help build these important scientific skills* • Use all their senses in hands-on exploration of natural materials • Explore collections of materials with similar and/or different properties • Explore how things work • Explore and talk about different forces they can feel • Talk about the differences between materials and changes they notice • Understand 'why' questions, like: "Why do you think the caterpillar got so fat?"					
Key knowledge (Overarching)	• Talk about what they see, using a wide vocabulary • Understand the key features of the life cycle of a plant and an animal • Plant seeds and care for growing plants • Begin to understand the need to respect and care for the natural environment and all living things • Make healthy choices about food, drink, activity and toothbrushing					
Key knowledge (Topic specific)	We can bend our arms and legs because we have elbows and knees.	Different materials feel different. Hard, strong materials are best for building walls with.	If you play an instrument gently it makes a quiet sound. If you play an instrument hard it makes a loud sound.	You can make a boat sink if you add weights. When paper/card gets wet it gets soggy.	When it is spring it is warmer, and flowers and plants start to grow. If you plant a seed in soil and water it, it will grow.	Pets need food, water and shelter. In summer it is hot, and we can get thirsty and sweaty in hot weather.

	When it is autumn, seeds fall from trees. They are called conkers, acorns and pinecones.	In winter it can be very cold we need to keep warm.		Plastic doesn't get soggy in water.		
Key vocabulary	cheeks chin shoulders knees elbows acorn pinecone pumpkin squirrel	hard strong rough smooth metal brick glass wood cement	piano tambourine guitar maracas beat strum fast slow echo	sail mast float sink anchor push pull steer	plant grow warm seed soil	kennel tank cage hutch lead medicine vet sweaty thirsty

Pakeman Primary School
Science curriculum – Nursery
Year B

Year B	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topic	**Marvellous Me**	**Building & Construction**	**Songs & Rhymes**	**Dinosaurs**	**People Who Help Us**	**On Safari**
Science-related mini themes	**Facial features Body parts Autumn**	**Different materials for building Winter**	**Body percussion**	**Dinosaur names Excavation play Dinosaur small-world**	**Different job roles Dental care Fire safety Spring**	**Animal names Animal habitats Animal features Summer**
Key skills	*Early science skills are foundational and are developed through play and everyday experiences. Opportunities for children to explore and observe the world around them help build these important scientific skills* • Use all their senses in hands-on exploration of natural materials • Explore collections of materials with similar and/or different properties • Explore how things work • Explore and talk about different forces they can feel • Talk about the differences between materials and changes they notice • Understand 'why' questions, like: "Why do you think the caterpillar got so fat?"					
Key knowledge (Overarching)	• Talk about what they see, using a wide vocabulary • Understand the key features of the life cycle of a plant and an animal • Plant seeds and care for growing plants • Begin to understand the need to respect and care for the natural environment and all living things • Make healthy choices about food, drink, activity and toothbrushing					
Key knowledge (Topic specific)	We can bend our arms and legs because we have elbows and knees. When it is autumn, seeds fall from trees. They are called conkers, acorns and pinecones.	Different materials feel different. Hard, strong materials are best for building walls with. In winter it can be very cold we need to keep warm.	We can make different sounds using different parts of our bodies. Hard actions make a loud sound, gentle actions make a quiet sound.	Dinosaurs don't exist anymore, they are extinct. Dinosaur bones and skeletons still exist, they have been buried in the ground for a very long time.	It is important to keep healthy and safe. Doctors, nurses and dentists can help keep us well and healthy. It gets warmer in spring and plants and flowers start to grow.	These animals live in the desert where it is hot. In summer it is hot, and we can get thirsty and sweaty in hot weather.

Key vocabulary	cheeks chin shoulders knees elbows acorn pinecone pumpkin squirrel	hard strong rough smooth metal brick glass wood cement	clap stamp click pat hum	Tyrannosaurus Rex Triceratops Stegosaurus extinct bones skeleton claws scales fossil	healthy safe medicine exercise plant grow warm seed soil	lion giraffe rhinoceros hippopotamus ostrich binoculars compass desert

Pakeman Primary School
Science curriculum - Reception

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topic	**Who Am I?**	**Bears**	**What We Eat**	**Traditional Tales**	**Spring**	**Adventures**
Science-related mini themes	**Similarities & differences The senses Autumn**	**Different types of bears Habitats Winter**	**Healthy eating Where food comes from Cooking**	**Growing beans**	**Minibeasts Lifecycles Spring**	**Animal adventures Space adventures**
Key skills	• Explore the natural world around them • Describe what they see, hear and feel whilst outside • Ask questions to find out more and to check what has been said to them • Articulate their ideas and thoughts in well-formed sentences • Describe events in some detail • Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen • Use new vocabulary in different contexts					
Key knowledge (Overarching)	• Learn new vocabulary • Understand the effect of changing seasons on the natural world around them • Recognise some environments that are different to the one in which they live • Know and talk about the different factors that support their overall health and wellbeing: - regular physical activity - healthy eating - toothbrushing - sensible amounts of 'screen time' - having a good sleep routine - being a safe pedestrian					
Key knowledge (Topic specific)	In some ways we are similar to our friends and in some ways we are different. We use our senses to smell, taste, touch, hear, and see.	Polar bears, panda bears and brown bears are different types of bears. Polar bears, panda bears and brown bears live in different places. The place a bear lives is called its 'habitat'.	Some foods are healthy, and some foods are unhealthy. We should eat lots of healthy foods because they are good for us. Fruit and vegetables contain vitamins. Sugar is not good for our teeth.	Beans and seeds need water to sprout and grow. A shoot appears when a bean or seed sprouts and this grows into a plant. Roots grow from the bottom of a bean or seed as it grows.	A caterpillar hatches from an egg. It then forms a chrysalis and emerges as a butterfly. The butterfly lays an egg and this 'lifecycle' continues.	Some animals live in hot countries, and some animals live in cold countries. Someone who explores space is called an astronaut. We live on a planet called Earth.

	We use our nose to smell, our tongue to taste, and hands to touch, and ears to hear and our eyes to see. In autumn, seeds fall from trees and new trees grow from these.	A baby bear is called a cub. Some bears hibernate in winter when it is cold.	Flour is made from ground wheat grains which grow on a plant.	Roots allow plants to 'drink' water and help them stay upright in the soil. Plants need sunlight to grow.	Bees are pollinators and are very important for the life cycle of a plant.	When astronauts explore space, they 'float'. This is because there is no gravity.
Key vocabulary	same different senses smell taste touch hear harvest	polar bear panda bear brown bear habitat hibernate cave hunt cub	cook bake raw crop grain vitamins healthy unhealthy	sprout shoot root stem sunlight observe	lifecycle caterpillar butterfly chrysalis egg insect antennae hive pollinate sunflower	safari explore spaceship planet Earth gravity launch astronaut

Pakeman Primary School
Science Curriculum - Year 1/2
Year A

Year A	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topic	**Heroes**	**Toys**	**Celebrations**	**Kings and Queens**	**Minibeasts**	**Classroom adventures**
Science Unit of Work	**Forces and Space** Seasonal Changes	**Materials** Everyday Materials	**Materials** Uses of Everyday Materials	**Living Things and Their Habitats** Habitats	**Living Things and their Habitats** Microhabitats	**Making Connections** Science Through Stories
Key skills	**Scientific Enquiry:** • Ask simple questions and recognise they can be answered through observation or tests • Identify living and non-living things **Practical Skills:** • Perform basic tests (e.g., growing plants with/without water) • Use simple equipment (e.g., a hand lens, thermometer) **Analysis and Communication:** • Record results using pictures or simple charts • Identify patterns in results (e.g., animals with fur live in colder climates)					
Key knowledge (Overarching)	*At this stage, children begin to explore the world around them through observation and simple questioning. They learn about living things, materials, and seasonal changes, laying the foundation for scientific curiosity* **Living Things and Their Environments:** • Understanding animals (including humans) and plants, their life cycles, basic needs, and how they interact with their habitats **Everyday Materials and Their Properties:** • Identifying, comparing, and exploring the uses of different materials and how they change **Seasonal Changes and Simple Forces:** • Observing weather patterns, day length, and how things move (pushes, pulls, gravity, and magnetism)					

Key knowledge (Topic specific)	**The Four Seasons** The four seasons are spring, summer, autumn, and winter, and they always occur in this order. **Weather and Seasons** Each season has different weather patterns in the UK. For example, summer is usually warmer, and winter is colder. **Day Length Across Seasons** Day length changes throughout the year, with longer days in summer and shorter days in winter. **Sun Safety** It is unsafe to look directly at the Sun because it can harm your eyes. **Science in Action** Many jobs use scientific knowledge, like a weather reporter who studies	**What Are Objects and Materials?** Objects are items or things, and a material is what an object is made from. **Examples of Everyday Materials** Everyday materials include wood, plastic, glass, metal, water, and rock. **What Are Properties?** A material's properties describe how it looks, feels, or behaves (e.g., hard, soft, shiny, or rough). **Grouping Materials** Materials can be grouped based on their physical properties, such as hardness, flexibility, or transparency. **Why It Matters** Understanding materials and their properties helps us choose the right	**Materials and Their Uses:** Objects are made from materials suited to their purposes. A single material can serve multiple uses, and different materials can be used for the same purpose. **Forces and Solid Objects:** A push or pull is required to change the shape of a solid object, which can be stretched, twisted, or bent. The force needed varies between objects. **Science in Careers:** Scientific knowledge and methods are essential in a wide range of jobs and careers, from engineering to healthcare and beyond. **Science and Discovery:** Science continues to evolve	**Life Processes:** Living things exhibit processes such as movement, reproduction, sensitivity, and growth. These processes help distinguish living things from those that are dead or have never been alive. **Diversity of Life:** There is a wide variety of plants and animals, each with distinct characteristics that differentiate them from one another. **Habitats:** Habitats, such as woodlands, oceans, rainforests, and coastal areas, provide the essential resources that plants and animals need to live and grow. **Interdependence:** Living things depend on each other for food, shelter, and	**Variety of Plants and Animals** There are many different types of plants and animals, and they each have their own unique features and characteristics. **What is a Habitat?** A habitat is the environment where an animal or plant lives, providing the resources they need to survive, such as food, water, and shelter. **What is a Microhabitat?** A microhabitat is a very small habitat, like under stones, logs, or leaf litter, where small organisms can live. **Dependence Between Living Things** Living things rely on each other for important needs,	**Plant Structure and Growth:** Plants have basic structures like leaves, flowers (blossom), fruit, roots, bulbs, seeds, trunks, branches, and stems. Plants grow and change over time, progressing through stages of development. **Animals and Their Characteristics:** Common animals, including fish, amphibians, reptiles, birds, and mammals, have distinct body parts such as arms, legs, wings, tails, fins, heads, trunks, horns/tusks, and shells. **Animal Diets:** Animals can be carnivores (eating other animals, e.g., lions), herbivores (eating plants, e.g., cows), or omnivores (eating both, e.g., bears).

	and explains seasonal changes.	material for different uses.	through recent discoveries and news, showcasing its dynamic role in understanding and improving the world.	survival, forming interconnected relationships within their habitats. **Food Chains:** Food chains illustrate how animals obtain food by eating plants and/or other animals, showing the flow of energy through an ecosystem.	such as food and shelter. **Interactions in Nature** Animals and plants depend on their surroundings and other living things to help them grow, survive, and reproduce.	**Materials and Properties:** Everyday materials, such as wood, plastic, glass, metal, water, and rock, have distinct physical properties that describe their appearance, texture, and function. **Seasonal Changes:** The four seasons—spring, summer, autumn, and winter—occur in order and are associated with specific weather patterns that vary throughout the year (e.g., in the UK).
Key vocabulary	seasons spring summer weather Daylight deciduous tree evergreen tree season weather	absorbent fabric glass group material metal object plastic rock tough waterproof wood	elastic fabric flexible glass material metal object plastic property rock suitable wood	alive carnivore dead depend diet energy food chain growth habitat herbivore life processes mammal omnivore predator	food chain microhabitat minibeast research results test Examples of habitats: woodland, desert, arctic Examples of microhabitats: short grass, flowers, inside rotting wood	amphibian bird carnivore fish herbivore mammal material object omnivore reptile season trunk waterproof weather

				prey shelter sort		
Week 1	Wonderful weather LO: To identify how the weather changes across the four seasons.	Naming materials LO: To identify everyday materials. LO: To sort objects into groups based on the materials they are made from.	Objects and materials LO: To recognise that objects are made from materials that suit their uses. LO: To recognise that objects can be grouped.	Life processes LO: To identify some of the characteristics of living things.	Identifying and classifying minibeasts LO: To classify a variety of minibeasts.	Do taller trees have wider trunks? LO: To observe changes across the seasons. LO: To spot patterns in data.
Week 2	Seasonal activities LO: To identify events and activities that take place in different seasons.	Material detectives LO: To recognise the difference between objects and materials.	Which material is suitable? LO: To recognise that objects are made from materials that suit their uses.	It feels good to be alive LO: To recognise the difference between things that are alive, were once alive or have never been alive. LO: To classify objects into groups.	Introduction to scientific enquiry LO: To recognise how scientists answer questions.	Comparing woodland animals LO: To describe and compare the features of animals. LO: To carry out research to find specific information.
Week 3	How do trees change? LO: To recognise how trees change across the four seasons.	Introduction to properties LO: To describe the properties of materials.	Stretch it, twist it, bend it, squash it! LO: To recognise that the shape of some solid objects can be changed.	Introduction to habitats LO: To identify plants and animals in different habitats.	Minibeast hunt LO: To recognise that living things live in habitats to which they are suited.	Measuring animal footprints LO: To identify differences in animal features. LO: To use a ruler to measure.

			LO: To record data in a table.		LO: To gather and record data to answer a question.	
Week 4	Daylight hours LO: To recognise that daylight hours change across the four seasons. LO: To record data in a pictogram.	Is it absorbent? LO: To group materials based on their properties (absorbency). LO: To make observations and record data	Testing stretchiness LO: To compare the suitability of materials for particular uses. LO: To gather data and use it to answer a question.	Woodland LO: To identify how a habitat provides animals and plants with what they need to survive. LO: To carry out research to find answers to questions.	Planning an experiment LO: To ask questions and plan how to carry out an experiment.	Building an animal home LO: To describe the properties of everyday materials. LO: To plan how to carry out a test.
Week 5	Observing over time LO: To observe changes across the four seasons. LO: To gather and record data about how seasons change over time.	Is it waterproof? LO: To group materials based on their properties (waterproofness). LO: To plan a test and suggest what might happen.	Testing strength LO: To recognise that the strength of some materials can be changed. LO: To record data in a block graph.	Rainforest and ocean habitats LO: To recognise how animals and plants depend on each other.	Woodlice experiment LO: To carry out an experiment and record data in a table	Are birds carnivores, herbivores or omnivores? LO: To identify animals that are carnivores, herbivores and omnivores.
Week 6	Weather reports LO: To plan and carry out a weather report.	Is it tough? LO: To group materials based on their properties (toughness). LO: To answer questions based on results.	Eco-friendly materials LO: To compare the suitability of materials for particular uses. LO: To recognise that some materials are harmful to the environment.	Food chains LO: To recall how animals get their food from plants and other animals.	What is a botanist? LO: To identify a variety of flowering plants. LO: To understand the role of a botanist.	N/A

Pakeman Primary School
RE curriculum - Year 1/2
Year B

Year B	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topic	**This is Me!**	**Animals**	**Explorers**	**The Circus**	**Inventions**	**Holidays**
Science Unit of Work	**Animals including Humans** Sensitive Bodies	**Animals including Humans** Comparing Animals	**Animals including Humans** Life cycles and health	**Plants** Introduction to Plants	**Plants** Plant Growth	**Making connections** Plant Based Materials
Key skills	**Scientific Enquiry:** • Ask simple questions and recognise they can be answered through observation or tests • Identify living and non-living things **Practical Skills:** • Perform basic tests (e.g., growing plants with/without water) • Use simple equipment (e.g., a hand lens, thermometer) **Analysis and Communication:** • Record results using pictures or simple charts • Identify patterns in results (e.g., animals with fur live in colder climates)					
Key knowledge (Overarching)	*At this stage, children begin to explore the world around them through observation and simple questioning. They learn about living things, materials, and seasonal changes, laying the foundation for scientific curiosity* **Living Things and Their Environments:** • Understanding animals (including humans) and plants, their life cycles, basic needs, and how they interact with their habitats **Everyday Materials and Their Properties:** • Identifying, comparing, and exploring the uses of different materials and how they change **Seasonal Changes and Simple Forces:** • Observing weather patterns, day length, and how things move (pushes, pulls, gravity, and magnetism)					

Key knowledge (Topic specific)	**Parts of the Human Body** The human body has many key parts, including the head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, and teeth. **The Five Senses** The five senses are sight, smell, hearing, taste, and touch. **How the Senses Work** Each sense uses a specific body part: Eyes for sight Nose for smell Ears for hearing Tongue for taste Skin for touch **Science in Everyday Life** A range of jobs and careers use scientific knowledge, from doctors to engineers. **Modern-Day Scientists** Modern scientists continue to make	**Animal Groups:** Common animals can be grouped into fish, amphibians, reptiles, birds, and mammals, each with distinct features. **Animal Body Parts:** Animals have specific body parts like arms, legs, wings, tails, fins, heads, trunks, horns, tusks, and shells, adapted for movement, protection, and survival. **Carnivores:** Carnivores are animals that eat other animals, such as lions, hawks, and sharks. **Herbivores:** Herbivores are animals that eat only plants, such as cows, giraffes, and caterpillars. **Omnivores:** Omnivores are animals that eat	**Human Life Cycle** The human life cycle includes the stages of baby, toddler, child, teenager, and adult. Humans grow and change as they age. **Animal Life Cycles and Survival** Different animals have different life cycles. All animals need air, water, and food to survive. **Personal Hygiene** Practicing good personal hygiene, like washing hands and changing clothes, helps prevent the spread of germs and keeps us healthy. **Healthy Eating** Humans need a balanced diet to stay healthy. The five food groups are carbohydrates, fruits and	**Variety of Plants:** Common plants vary in types and features, including flowering plants, trees, and shrubs. Deciduous trees lose their leaves seasonally, while evergreen trees retain them year-round. **Plant Structure:** Plants have basic structures, such as leaves, flowers (blossom), petals, fruit, roots, bulbs, seeds, trunks, branches, and stems, which support growth and reproduction . **Plant Growth and Change:** Plants grow and change over time, undergoing processes like germination, flowering, and fruiting as part of their life cycle.	**Seed Germination** Seeds and bulbs grow into seedlings by producing roots and shoots. They need water and warmth to germinate. **Plant Growth** Seedlings grow into mature plants by developing roots, stems, leaves, and flowers. **What Plants Need** Plants require water, light, and a suitable temperature to grow and stay healthy. **Science in Action** There are many jobs and careers that use scientific knowledge and methods, such as botanists and farmers. **Links with Society** Science has spiritual, moral, social, and cultural links that connect to how plants are used and	**Plant Growth:** Seeds and bulbs grow into seedlings by developing roots and shoots. Seeds need water and warmth to germinate, and plants require water, light, and a suitable temperature for growth and health. **Living and Non-Living Things:** Living things exhibit processes like movement, reproduction, growth, sensitivity, excretion, and nutrition. This distinguishes them from things that are dead or have never been alive. **Material Suitability:** Objects are made from specific materials based on their properties and suitability. Some materials serve multiple purposes, while different materials can be

	discoveries and use science to solve real-world problems.	both plants and animals, such as bears, raccoons, and humans.	vegetables, dairy and alternatives, protein, and oils and spreads. **Exercise and Well-Being** Regular exercise improves how the body performs and helps maintain well-being.	**Famous Scientists:** Contributions of historical scientists have shaped our understanding of plants and biology, paving the way for modern advancements. **Modern Scientists:** Current scientists continue to explore plant biology and ecosystems, using their work to address global challenges like food security and climate change	valued around the world.	used for the same purpose, depending on the needs. **Material Behaviour**: Solid objects can be squashed, bent, twisted, or stretched, while certain materials may be unsuitable for specific uses due to their limitations. **Science and Scientists:** Both historical and modern-day scientists have advanced our understanding of plants, materials, and living organisms, shaping our knowledge and driving innovation.
Key vocabulary	Sense(s) sight hearing touch taste smell Parts of the body e.g. eyes, legs, nose, teeth compare	amphibian bird carnivore compare diet difference fish group herbivore mammal	diet germs air water basic needs egg health hygiene life cycle live young	bulb deciduous diagram evergreen flower fruit garden plants group growth leaf	bulb diagram energy flower germinate growth leaf life cycle nutrient observe	alive dead fabric flexible germinate growth invention life processes material plastic

	group hearing pattern	omnivore reptile similarity	pupa spawn survive teenager toddler tadpole	measure observe roots seed stem trunk wild plants	seed shoot stem	property results seed suitable test waterproof wood
Week 1	Body parts LO: To name parts of the human body. LO: To sort body parts into groups.	Animal groups LO: To identify and group animals.	The human life cycle LO: To identify different stages of the human life cycle.	What is a plant? LO: To identify plants in the school grounds. LO: To plan an investigation	What do seeds need to grow? LO: To recognise that seeds need certain conditions for growth. LO: To plan comparative tests.	Reduce, reuse, recycle LO: To describe how materials can be reused. LO: To understand how the 3Rs contribute to sustainable products.
Week 2	The senses LO: To name the body parts used for each sense. LO: To spot patterns in data.	Describing animals LO: To describe a variety of animals.	Life cycles LO: To know which offspring come from which parent animal.	Parts of a plant LO: To identify parts of a flowering plant. LO: To draw and label a diagram.	Seeds and bulbs LO: To recognise that seeds and bulbs contain what they need to grow into a plant. LO: To measure with a ruler.	From plants to products LO: To identify human-made and natural materials. LO: To group based on characteristics.
Week 3	Taste and touch LO: To identify the body parts used for the sense of taste and touch.	Comparing animals LO: To compare the features of animals.	Growth LO: To observe and measure growth in humans.	Wild and garden plants LO: To identify and name wild and garden plants.	Germination LO: To describe what seeds, need to germinate. LO: To record data in a table.	Testing suitability LO: To identify suitable materials based on their properties.

	LO: To use the senses to make observations.		LO: To use simple measuring equipment.	LO: To sort flowers into groups.		LO: To perform a test and gather data.
Week 4	Sight and smell LO: To identify the body parts used for the sense of smell and sight. LO: To recognise that scientists are always making new discoveries.	Carnivore, herbivore or omnivore? LO: To identify animals that are carnivores, herbivores and omnivores. LO: To research using non-fiction texts.	Survival LO: To identify and list the basic needs for survival for humans and animals. LO: To use secondary sources to research.	Deciduous and evergreen trees LO: To identify and name deciduous and evergreen trees. LO: To measure and compare leaves.	Light and plant growth LO: To describe the effect of light on plant growth. LO: To observe using a magnifying glass.	Testing plant pots LO: To identify a material to help plant growth. LO: To use observations to answer a simple question.
Week 5	Hearing LO: To identify the body part used for the sense of hearing. LO: To investigate how sound changes as you move further away.	Pets LO: To recognise animals that make suitable pets. LO: To gather and record data to help in answering questions.	Exercise and hygiene LO: To recognise the importance of exercise and personal hygiene. LO: To make observations over time.	Sorting seeds LO: To recognise that new plants come from seeds and bulbs. LO: To recognise that observations do not always match predictions.	Plant life cycle LO: To identify stages of a plant's life cycle. LO: To draw and label diagrams.	Choosing materials LO: To choose materials to create a suitable plant pot. LO: To identify and classify living things.
Week 6	Senses in action LO: To recognise how the senses are used in everyday life. LO: To recognise the importance of the senses in certain jobs.	Jane Goodall LO: To describe and compare the structure of animals. LO: To know about famous scientists throughout history.	Balanced diet LO: To identify how to have a balanced diet. LO: To interpret collected results.	Which plant parts can you eat? LO: To recognise the importance of a scientist's role. LO: To use observations to find answers to questions.	Plant care LO: To recognise what plants need for healthy growth. LO: To recognise that humans have a responsibility to care for plants.	

Pakeman Primary School
Science curriculum - Year 3/4
Year A

Year A	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topic	**Stone Age to Iron Age**	**Journeys**	**Anglo Saxons**	**Mountains**	**Time-travellers**	**Rainforests**
Science Unit of Work	**Animals Including Humans** Digestion and Food	**Electricity** Electricity and Circuits	**Sound (4S)** Sounds and Vibrations	**Living things and their habitats (4LvH)** Classification and Changing Habitats	**Materials** States of Matter	**Making connections:** How does the flow of liquids compare?
Key skills	**Scientific Enquiry:** • Set up simple comparative tests (e.g., how different materials react to heat) • Make predictions before conducting investigations **Practical Skills:** • Measure accurately using rulers and thermometers • Record observations systematically (e.g., in a table) **Analysis and Communication:** • Use scientific language to describe findings (e.g., "The shadow gets shorter at noon") • Present results using basic charts or diagrams					
Key knowledge (Overarching)	*As their thinking develops, children begin to explore scientific concepts in greater depth and conduct simple investigations. They build on their understanding of living things, materials, and forces, making connections between ideas* **Living Things, Animals, and Humans:** • Understanding nutrition, skeletons and muscles, plant functions, life cycles, habitats, and food chains **States of Matter, Rocks, and Materials:** • Exploring solids, liquids, and gases, the water cycle, rock types, and how materials can change through heating, cooling, and other processes **Forces, Light, and Electricity:** • Investigating magnetism, friction, simple circuits, the properties of light, and how shadows are formed					

Key knowledge (Topic specific)	**The Digestive System** The main organs of the digestive system are the mouth, teeth, tongue, oesophagus, stomach, small intestine, and large intestine. Each organ has a different job to help digest food. **Teeth and Their Care** Humans have different types of teeth (incisors, canines, premolars, and molars) for different jobs. Teeth can be damaged by sugary and acidic foods, so it's important to brush twice a day, eat healthy foods, and visit the dentist.	**Power Sources and Circuits:** All electrical appliances require a power source, such as batteries or mains electricity, and a complete circuit path for electrical charge to flow. **Conductors and Insulators:** Materials like metals are electrical conductors that allow charge to pass through quickly, while materials like wood and plastic are insulators that resist charge. **Circuit Components:** A series circuit includes components like wires, switches, and bulbs. An open switch breaks the circuit (turning components off), while a closed switch completes it (turning components on). **Materials in Wiring:** Metals are used for wires and cables because they conduct electricity effectively,	**Sound and Vibrations**: Sound is caused by vibrations, which travel through mediums to reach the ear. **Sound Insulation**: Insulating materials reduce vibrations, protecting ears from damaging sounds, with different materials providing varying levels of insulation. **Pitch and Vibrations**: The pitch of a sound depends on the speed of vibrations—quicker vibrations create higher pitches, while slower vibrations create lower pitches. **Volume and Vibrations**: The volume of a sound is determined by the strength of vibrations—stronger vibrations produce louder sounds, and weaker vibrations	**Grouping Living Things** Living things can be grouped in different ways, such as by their features or how they grow. A classification key helps group and identify plants and animals. **Vertebrates and Invertebrates** Vertebrates have backbones and include birds, mammals, reptiles, amphibians, and fish. Invertebrates, like snails, worms, spiders, and insects, do not have backbones. **Types of Plants** Plants can be grouped as flowering (like grasses) or non-flowering (like ferns and mosses). **Habitats and Changes** Habitats can change throughout the year, which might make it harder for living things to survive.	**States of Matter**: Substances exist as solids, liquids, or gases, each with distinct properties: solids maintain shape unless a force is applied, liquids flow freely and take the shape of a container, and gases have no fixed shape and can escape unsealed spaces. **Changes of State**: Heating causes solids to melt into liquids and liquids to evaporate into gases; cooling causes gases to condense into liquids and liquids to freeze into solids. **Water Properties**: Water can exist as a solid, liquid, or gas, with a melting point of 0°C and a boiling point of 100°C.	**States of Matter and the Water Cycle:** Materials can be grouped as solids, liquids, or gases. Evaporation and condensation are key processes in the water cycle, with the rate of evaporation increasing at higher temperatures. **Classification and Habitats:** Classification keys help identify and group living things in various environments. Environmental changes can sometimes pose dangers to these organisms. **Electricity and Circuits:** A switch controls the flow in a circuit, determining if a lamp lights in a series circuit. Metals are good conductors, while other materials like wood and plastic act as insulators.

	Teeth in Animals The teeth of carnivores (meat-eaters) and herbivores (plant-eaters) are different because they are adapted to their diets. **Food Chains** Producers make their own food, like plants. Food chains show how energy passes from producers to consumers (animals), with arrows showing the flow of energy. Predators hunt their food, and prey are the animals being hunted. **Science and Scientists** Famous scientists and modern-day researchers use different tools and methods to discover new knowledge.	while plastic coatings provide insulation for safety. **Bulb Brightness:** The brightness of bulbs in a circuit decreases as the number of bulbs increases due to shared electrical energy.	produce quieter sounds. **Distance and Faintness**: Sounds become fainter as the distance from the sound source increases.	**Human Impact on the Environment** Humans can have a positive impact, like protecting habitats, or a negative impact, like causing pollution	**The Water Cycle**: Water moves continuously through the water cycle, involving evaporation (water turning into vapour), condensation (vapour forming water droplets in clouds), and precipitation. **Evaporation and Temperature**: The rate of evaporation increases as temperature rises, influencing processes like the water cycle.	**Sound and Vibrations:** Sounds are produced by vibrations, which travel through a medium to the ear, allowing us to hear. **Digestion and Food:** The human digestive system has basic parts with specific functions that process food and support the body's nutrition.

	Science has changed over time and is linked to spiritual, moral, social, and cultural issues. Many jobs, like doctors and environmentalists, rely on scientific knowledge.					
Key vocabulary	canine digest digestive system ethics faeces incisor large intestine molar mouth nutrient oesophagus premolar producer proof saliva small intestine stomach	appliance battery/cell bulb buzzer circuit electrical conductor electrical insulator electricity mains motor power source property switch wire	eardrum insulator pitch proof sound vibration volume	classification key classify conservation deforestation endangered group insect invertebrate nature reserve non-flowering plants vertebrate	condensing evaporating evaporation rate freezing gas liquid melting precipitation solid steam temperature thermometer the water cycle	condensing cell/battery evaporating gas insect liquid medicine motor pharmacology pharmacologist precipitation solid switch temperature the water cycle viscosity water vapour
Week 1	Human Digestive System LO: To describe the function of the human digestive system.	Using electricity LO: To recognise how electrical appliances are powered. LO: To record and classify qualitative data.	Vibrations LO: To describe how sounds are made. LO: To observe closely how different	Grouping living things: Vertebrates and invertebrates LO: To group animals in various ways.	Solids LO: To ask relevant questions about the properties of solids.	Investigating liquids – Planning LO: To revise the units States of matter and Classification and changing habitats.

	LO: To evaluate a model.		instruments create a sound.	LO: To record data in different ways.	LO: To identify solids using their properties	LO: To plan a comparative test.
Week 2	Human Teeth LO: To recognise the different types of human teeth and their roles in eating. LO: To describe real observation methods and evidence collected.	Building circuits LO: To construct an electrical circuit. LO: To draw a scientific diagram.	Sound waves LO: To describe how sounds are heard through different mediums. LO: To research how whales and dolphins communicate underwater.	Grouping Living Things: Plants LO: To group plants in various ways. LO: To apply and create classification keys.	.Liquid and Gases LO: To identify liquids and gases using their properties LO: To use results simple conclusions about the properties of liquids.	Investigating liquids – Gathering data LO: To revise the unit Electricity and circuits. LO: To gather and record data.
Week 3	Investigating Dental Hygiene LO: To explain how to care for our teeth. LO: To plan an enquiry by considering which variables should be changed, measured and controlled.	Switching on and off LO: To explain the use of switches in a circuit.	Volume LO: To describe the relationship between vibration strength and volume. LO: To present results using a bar chart.	Classification Keys LO: To make careful observations. LO: To make and use classification keys.	Melting and freezing LO: To describe melting and freezing. LO: To use thermometers to take accurate measurements before and after melting.	Investigating liquids – Analysing, concluding and evaluating LO: To revise the units States of matter and Sound and vibrations. LO: To conclude and evaluate the investigation.
Week 4	Teeth of Carnivores, Herbivores and Omnivores.	Investigating electrical conductors and insulators LO: To explain the use of materials as electrical	Volume and distance LO: To describe the relationship between volume and distance.	Habitats and Seasonal Change LO: To recognise and describe different	Condensing and evaporating LO: To describe condensing and evaporating.	Investigating liquids – Extending LO: To revise the unit Digestion and food.

	LO: To recognise that differences in teeth relate to an animal's diet. LO: To group animals based on their diet.	conductors or insulators. LO: To write a method.	LO: To suggest which variables to measure and for how long.	habitats and their inhabitants. LO: To gather, record, classify and present data.	LO: To make predictions for new values about evaporation rates.	LO: To observe carefully and apply these observations to problem solve.
Week 5	Producers, predators and prey in food chains LO: To recognise producers, predators and prey in food chains. LO: To analyse patterns and form conclusions using scientific knowledge.	Investigating bulb brightness LO: To investigate what affects bulb brightness. LO: To pose questions and plan ways to test them.	Pitch LO: To describe pitch and how to change it. LO: To design simple results tables.	Human Impacts on Habitat LO: To recognise the impact humans can have on habitats. LO: To research using an information sheet.	The water cycle LO: To describe the different stages of the water cycle. LO: To record the stages of the water cycle using a labelled diagram.	Investigating liquids – Presenting LO: To revise the unit States of matter. LO: To report on my findings.
Week 6	Poo Clues LO: To recognise that animal poo can give us clues about digestion, teeth and diet. LO: To construct a results table for recording observations.	Electrical safety LO: To explain how to be safe around electricity. LO: To explore how scientific advances inform safety advice.	Sound insulation LO: To explain how insulating materials can be used to muffle sound. LO: To identify when results or observations do not match predictions.	Natural Changes on Habitat LO: To recognise the impact of natural disasters on habitats.	Climate change and the water cycle LO: To describe how temperature affects evaporation rates and the water cycle. LO: To research climate change and the water cycle.	N/A

Pakeman Primary School
RE curriculum - Year 3/4
Year B

Year B	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topic	**Ancient Egypt**	**Energy and power**	**Romans**	**Active Planet**	**Chocolate**	**Europe**
Science Unit of Work	**Animals Including Humans (3AH)** Movement and Nutrition	**Light** Light and Shadows	**Forces and Space** Forces and Magnets	**Materials** Rocks and Soil	**Plants** Plant Reproduction	**Making Connections** Does hand span affect grip strength?
Key skills	**Scientific Enquiry:** • Set up simple comparative tests (e.g., how different materials react to heat) • Make predictions before conducting investigations **Practical Skills:** • Measure accurately using rulers and thermometers • Record observations systematically (e.g., in a table) **Analysis and Communication:** • Use scientific language to describe findings (e.g., "The shadow gets shorter at noon") • Present results using basic charts or diagrams					
Key knowledge (Overarching)	*As their thinking develops, children begin to explore scientific concepts in greater depth and conduct simple investigations. They build on their understanding of living things, materials, and forces, making connections between ideas* **Living Things, Animals, and Humans**: • Understanding nutrition, skeletons and muscles, plant functions, life cycles, habitats, and food chains **States of Matter, Rocks, and Materials**: • Exploring solids, liquids, and gases, the water cycle, rock types, and how materials can change through heating, cooling, and other processes **Forces, Light, and Electricity:** • Investigating magnetism, friction, simple circuits, the properties of light, and how shadows are formed					

Key knowledge (Topic specific)	**Skeletons in Animals** Animals can be grouped based on whether or not they have a skeleton. In humans and some animals, the skeleton provides movement, protection, and support. **Bones and Muscles** The muscular system works with the skeleton to allow movement. The main bones in the human body help provide structure and protect important organs. **Nutrition and Diet** Humans cannot make their own food, so they eat to get the nutrition they need. There are seven nutrient groups (carbohydrates, protein, fats, fibre, vitamins, minerals, and water), and each has an important job in the body.	**Light and Vision:** Light travels from sources like the Sun, light bulbs, and torches, enabling us to see. Darkness is the absence of light. **Light and Safety:** Light from the Sun can be harmful to eyes, requiring protection like sunglasses or shade. **Shadows and Reflection:** Shadows form when light is blocked by opaque objects. Their position and length change with the light source's position and distance, such as during the Sun's movement throughout the day. **Science in Action:** Scientific progress relies on methods and equipment that have evolved over time, with modern science built on historical advancements and collaboration.	**Contact and Non-Contact Forces:** Forces can be classified as contact forces, like friction, or non-contact forces, like magnetism, which act at a distance. **Magnetic Poles and Materials:** Magnets have north and south poles, and they attract or repel objects containing magnetic materials, such as iron and nickel. **Types of Magnets:** Magnets come in various forms, including bar, horseshoe, button, and ring magnets, each suited to specific purposes. **Uses of Magnets:** Magnets have practical applications in tools, machinery, electronics, and everyday items,	**Grouping Rocks** Rocks can be sorted by their appearance and properties, such as colour, texture, hardness, and whether they let water through (permeability). **Grains, Crystals, and Fossils** Some rocks contain grains, crystals, or fossils, which help us identify and classify them. **What is Soil?** Soil is made from broken-down rocks mixed with dead plants and animals (organic matter). **Uses of Rocks** The properties of rocks decide how we use them. For example, hard rocks are used for buildings, and softer rocks for carving. **How Rocks Change** Rocks can change over time through	**Parts of a Plant** The basic parts of a plant, such as the roots, stem, leaves, and flowers, have different functions. For example, roots absorb water, stems transport it, and leaves make food through photosynthesis. **What Plants Need to Grow** Plants need water, light, air, nutrients, and the right temperature to grow and stay healthy. Different plants have different needs for growth. **How Water Moves in Plants** Water is transported from the roots, through the	**Movement and Nutrition:** The muscular system works with the skeleton in humans and some animals to enable movement. The main food groups—carbohydrates, proteins, fats and oils, fibre, vitamins, minerals, and water—each have specific functions in the body. **Forces and Friction:** Friction is a contact force that slows objects down. Rougher surfaces create more friction than smoother ones, affecting movement. **Rocks and Soil:** The properties of rocks determine their suitability for various uses, linking their characteristics to practical applications. **Light and Shadows:** Shadows are formed when light from a source is blocked by

	Balanced Diets A balanced diet includes all nutrient groups in the right amounts. Animals have different diets depending on their needs. **Science in Action** Famous scientists throughout history, modern-day researchers, and many jobs and careers rely on scientific knowledge and methods. Science continues to help us learn more about the world.	**Science and Society:** Science connects with spiritual, moral, social, and cultural aspects of life, and knowledge is applied in a range of careers to improve understanding and solve problems.	leveraging their unique properties. **Friction and Magnetism:** Friction is a contact force that slows objects down, while magnetism is a non-contact force that influences objects made of magnetic metals.	weathering (breaking down) and erosion (being worn away by wind or water).	stem, to the leaves, where it helps the plant grow and make food. **The Plant Life Cycle** Plants grow from a seed to a mature plant. Flowers are the plant's reproductive organs, and pollination (moving pollen to the female part of the flower) leads to seed formation. **Seed Dispersal** Seeds are spread through different methods, like wind, animals, water, or explosions. Each method has benefits, like reaching new areas to grow.	an opaque object, demonstrating the interaction of light with materials. **Plant Reproduction:** Flowers are the reproductive organs of plants, with pollination involving the transfer of pollen to the female part of the flower, enabling seed formation.

Key vocabulary	balanced diet bone carbohydrate fat fibre invertebrate joint mineral movement muscle nutrient protection protein skeleton vertebrate vitamin	light source luminous mirror non-luminous opaque mirror reflect reflection reflective (shiny) results table shadow translucent transparent	attract contact force force friction magnet magnetic material magnetism non-contact force north pole repel south pole	bar chart conclusion crystal fossil grain hardness rock sediment sedimentary rock sedimentation soil	female flowering plant male pollen pollination record reproduction seed dispersal transport	bone carbohydrate fat flower fruit friction grip strength joint light source material muscle nutrition opaque property protein seed shadow
Week 1	Skeleton LO: To explain the role of a skeleton. LO: To group animals based on their physical properties.	Sources of Light LO: To explain the role of light sources. LO: To plan and draw a results table	Pushes, pulls and twists LO: To describe the effects of contact forces. LO: To label a diagram using arrows and scientific vocabulary.	Rock Appearance LO: To group rocks using their appearance. LO: To observe the appearance of rocks closely, using a magnifying glass	Plant Growth LO: To identify the growth and survival needs of plants. LO: To pose relevant questions	Investigating grip strength – Planning LO: To revise the units Movement and nutrition and Rocks and soil. LO: To plan a pattern seeking enquiry.
Week 2	The Bones in Our Body LO: To recognise the main bones in the body.	What is Reflection LO: To compare light reflecting on different surfaces.	Friction LO: To recognise the effects and uses of forces.	Rocks Physical Properties LO: To group rocks using their physical properties.	Structure and Function LO: To describe the relationship between structure and	Investigating grip strength – Gathering data LO: To revise the units Movement and

	LO: To measure and sort data.		LO: To write a scientific conclusion identifying cause and effect.	LO: To make predictions, suggest improvements and explain observations over time.	function in plants. LO: To design simple results tables.	nutrition and Plant reproduction. LO: To gather and record data.
Week 3	Muscles and Movements LO: To explain how muscles are used for movement. LO: To explore scientific advances.	Where do Shadows Come From? LO: To recognise which materials cast a shadow. LO: To ask testable questions and plan how to answer them.	Investigating friction LO: To interpret how and why things move differently on different surfaces. LO: To plan an investigation using variables.	Fossil Formation LO: To describe the process of fossil formation. LO: To present research on fossil formation.	Transporting Water LO: To investigate how water is transported in plants. LO: To plan a simple enquiry.	Investigating grip strength – Analysing, concluding and evaluating LO: To revise the unit Forces and magnets. LO: To conclude and evaluate the investigation.
Week 4	Eating for Survival LO: To explain how food is an essential energy source for animals. LO: To gather and compare data to answer questions.	Shadows Throughout the Day LO: To summarise how shadows change throughout the day. LO: To evaluate a method.	Magnets LO: To describe the effects of magnets. LO: To write a method.	Fossils and Palaentology LO: To identify fossils and group rocks accordingly. LO: To use the fossil record to answer questions about the past.	Flowers LO: To explore the role of flowers in the life cycle of a plant. LO: To complete, read and interpret data in a bar chart.	Investigating grip strength – Extending LO: To revise the unit Uses of materials. LO: To use sets of data to inform design.
Week 5	Nutrient Groups LO: To identify the main nutrient groups and their simple functions.	Investigating Shadows LO: To investigate how the distance of the light source affects the size of its shadow.	Investigating magnet strength LO: To compare the properties of	Soil Formation LO: To compare soils and how they were formed.	Evaluating an enquiry LO: To apply knowledge of	Investigating grip strength – Presenting LO: To revise the units Light and shadows and

	LO: To record information using secondary sources.	LO: To find patterns in data and form conclusions.	different types of magnets. LO: To display data using a bar chart.	LO: To record the drainage rate for different soils in a bar chart.	plant life and growth. LO: To identify and suggest changes to an enquiry.	Movement and nutrition. LO: To report on my findings using a shadow puppet display.
Week 6	Balanced Diets LO: To explain what makes a balanced diet. LO: To explore how knowledge has progressed over time and how different jobs use this information.	Using Light and Shadows LO: To tell a story using shadow puppets. LO: To recall how different people work with light and shadows.	Uses of magnets LO: To explain the uses of magnets. LO: To research the uses of magnets	Soil Layers and Earthworms LO: To describe a soil sample using sedimentation. LO: To draw and label a diagram.	Seed Dispersal LO: To explore seed dispersal methods. LO: To use results to draw conclusions.	N/A

Pakeman Primary School
Science curriculum - Year 5/6
Year A

Year A	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topic	**Ancient Greece**	**Weather and climate**	**Vikings**	**Antarctica**	**Windrush**	**Citizens of the World**
Science Unit of Work	**Forces and space:** Unbalanced forces	**Living things and Their Habitats:** Life cycles and reproduction	**Energy:** Circuits, Batteries and Switches	**Living Things and their Habitats:** Classifying Big & Small	**Living Things and their Habitats:** Evolution and Inheritance	**Making Connections:** Human Timeline
Key skills	**Scientific Enquiry:** • Plan and conduct fair tests (e.g., comparing materials for conductivity) • Make and test hypotheses **Practical Skills:** • Use a range of tools (e.g., circuit components, graduated cylinders) for precise measurements • Record findings with increasing precision, using tables and graphs **Analysis and Communication:** • Draw conclusions based on evidence and explain patterns • Use scientific vocabulary fluently to describe and report findings					
Key knowledge (Overarching)	*At this stage, children refine their ability to think scientifically, use evidence, and carry out more complex investigations. They deepen their knowledge of materials, forces, and life sciences while beginning to explore abstract scientific concepts* **Advanced Living Things and Life Processes:** • Understanding reproduction in plants and animals, human development, evolution, inheritance, adaptation, and the classification of living things **Properties and Changes of Materials:** • Investigating dissolving, reversible and irreversible changes, and properties like conductivity, transparency, and flexibility **Forces, Earth and Space, and Energy:** • Exploring gravity, air and water resistance, levers and pulleys, the solar system, the movement of planets, and how light and electricity behave in circuits					

Key knowledge (Topic specific)	**Gravity and Motion:** Gravity is a non-contact force that pulls objects together, causing unsupported objects to fall towards the Earth. **Friction and Resistance:** Friction, air resistance, and water resistance act in the opposite direction of a moving object. Rougher surfaces increase friction, affecting movement. **Effects of Balanced and Unbalanced Forces**: When forces are balanced, an object's speed, shape, or direction stays the same; when unbalanced, these properties change. **Mechanisms and Force:** Levers, pulleys, and gears are mechanisms	A **life cycle** shows the changes an animal or plant goes through, ending with the production of a new generation to continue the cycle. All **living things** must reproduce to ensure the survival of their species. **Sexual reproduction** needs two parents, while **asexual reproduction** only requires one parent. Plants and animals use different methods of reproduction, including **sexual** (with two parents) and **asexual** (with one parent). Many jobs, like biologists and botanists, use **scientific knowledge**, and new research is helping solve problems and make	A **series circuit** can include different components like bulbs, buzzers, and motors, which work together in one loop. **Circuit diagrams** use straight lines and standard symbols to represent components like wires, switches, and batteries. The **voltage of a circuit** can be changed, which affects how bright a bulb shines or how loud a buzzer sounds. Many **jobs and careers** use science, like engineers, doctors, and electricians, who apply scientific knowledge and methods. **Scientific evidence** helps support or challenge ideas, showing whether they are true or need to be changed.	**'Organism'** is a term used to refer to an individual living thing. **Micro-organisms** are incredibly small and cannot usually be seen by the naked eye. **Vertebrates** have backbones and include mammals, birds, reptiles, amphibians, and fish, while invertebrates, like insects and worms, do not have backbones. **Famous scientists** throughout history have made important discoveries that shaped our understanding of life and the natural world.	**Living things change over time**, and **fossils** help us learn about the creatures that lived millions of years ago. **Traits are passed from parents to offspring**, but offspring can vary, and over time, these variations can affect survival in different environments. **Evolution** is the process by which animals and plants adapt to their environments over millions of years. **Famous scientists** throughout history have shaped our understanding of science, and modern-day scientists continue to build on their work.	The **human life cycle** has six stages: baby, toddler, child, teenager, adult, and elderly, each with unique growth and development changes. **Puberty** happens during the teenage years, causing physical changes like body hair growth and deeper voices in boys, and periods and breast development in girls. The **gestation period** (time a baby grows inside the mother) is different for every mammal. For humans, it's about 9 months. Many **careers** use science, like doctors, midwives, and veterinarians, who study life cycles and reproduction. Scientists have developed **modern**

	that allow a smaller force to have a greater effect. **Surface Area and Resistance**: Larger surface areas create greater air or water resistance, influencing the motion of objects.	discoveries for the future.			**Scientific methods and evidence** have evolved, and collaboration and peer review are essential for scientific progress and for testing ideas.	**methods and tools** by building on discoveries and equipment from the past, improving how we study life cycles and the human body.
Key vocabulary	air resistance gear gravity lever line graph line of best fit pivot pulley surface area water resistance	adolescence asexual reproduction characteristic fertilisation germination gestation incubation lungs mating metamorphosis offspring ovule pollen pollination sexual reproduction	battery buzzer cell circuit circuit diagram current evidence hazard model relationship switch units voltage	characteristic classification key classify cold-blooded exoskeleton micro-organism organism warm-blooded	adaptation evolution extinct gene inherit inheritance natural selection offspring parent (biological) selective breeding variation	anomaly evidence foetus gestation period hormones life cycle line graph old age period (menstruation) puberty
Week 1	Gravity LO: To describe gravity and its effects. LO: To analyse data to write a conclusion.	Life cycles and reproduction in plants LO: To describe the life cycle of a plant, including the reproductive stage.	Components and circuits LO: To use recognised symbols for electrical components.	Carl Linnaeus and classification LO: To explain how organisms are classified using the Linnaean system.	Variation LO: To explain why there are differences within a species. To group factors.	Growing old LO: To describe how humans change from babies through to old age. LO: To use a line graph to identify

		LO: To observe and compare equivalent parts in different flowers.	LO:To model (represent) how an electrical circuit works.	LO: To give reasons for classifying animals based on their similarities and differences		patterns in height and predict values.
Week 2	Air Resistance LO: To describe air resistance and its effects. LO: To plan a fair test to investigate air resistance.	Life cycle of a mammal LO: To describe the life cycle of a mammal. LO: To research the life cycles of different mammals.	Circuit diagrams LO: To predict and present results for electrical circuits. LO: To use standardised symbols when drawing diagrams.	Cold-blooded vertebrates LO: To classify the cold-blooded vertebrate groups using their common characteristics. LO: To use a classification key to classify frog species.	Inheritance LO: To recognise the inheritance of characteristics in plants and animals. LO: To create and compare a mini genetic profile.	Puberty LO: To identify changes in males and females as a result of puberty.
Week 3	Water Resistance LO: To describe water resistance and its effects. LO: To design a results table.	Life cycle of a bird LO: To describe the life cycle of a bird and compare it with that of a mammal. LO: To pose questions to compare the life cycles of different birds.	Current and resistance LO: To recognise a link between the number of components and resistance. LO: To explain results using scientific knowledge.	Warm-blooded vertebrates LO: To classify the warm-blooded vertebrate groups using their common characteristics. LO: To use a classification key to classify vertebrates.	Adaptations LO: To explain why adaptation is necessary. LO: To explain how adaptations relate to a specific habitat and environment.	Comparing human gestation LO: To explore the gestation periods of humans and other animals. LO: To plot data on a scatter graph.
Week 4	Friction LO: To describe friction and its effects.	Life cycle of an amphibian LO: To describe the life cycle of an amphibian.	Batteries and voltage LO: To identify ways to change voltage within an electrical circuit To design a results table	Invertebrates LO: To classify invertebrates using their characteristics.	Modelling natural selection LO: To model how natural selection	N/A

	LO: To evaluate a method	LO: To suggest how temperature may affect egg hatching.		LO: To use a classification key to classify invertebrates.	affects population size. LO: To evaluate the degree of trust and pose new questions for further enquiry	
Week 5	Leavers, Pulleys and Gears (Part 1) LO: To describe the effects of levers, pulleys and simple machines on movement. LO: To draw and label a diagram.	Life cycle of an insect LO: To describe the life cycle of an insect and compare it with that of an amphibian. LO: To use data to describe a relationship and make predictions.	Voltage and bulb brightness LO: To investigate how voltage affects bulb brightness. LO: To plan an enquiry	Plants LO: To describe how the plant kingdom is organised (based on shared characteristics). LO: To produce a working classification key	Evolution LO: To describe the theory of evolution. LO: To consider evidence used to inform theories.	N/A
Week 6	Leavers, Pulleys and Gears (Part 2) LO: To describe the relationship between lever length and effort. LO: To draw an accurate line graph	Asexual reproduction in plants LO: To describe asexual reproduction in plants. LO: To represent root growth over time on a line graph	Practical circuits LO: To apply knowledge of circuits and components to a practical solution. LO: To recognise that scientific knowledge can solve a problem.	Micro-organisms LO: To describe and classify micro-organisms. LO: To use a classification key to classify bacteria	Evidence for evolution LO: To recognise evidence that can be used for evolution. LO: To consider the degree of trust in the evidence used.	N/A

Pakeman Primary School
RE curriculum - Year 5/6
Year B

Year B	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topic	**World War 2**	**Marvelous Maps**	**The Sikh Empire**	**South America**	**London**	**Food and farming**
Science Unit of Work	**Animals Including Humans:** Circulation and Health	**Forces and Space:** Earth and Space	**Energy:** Light and reflection	**Materials:** Mixtures and Separation	**Materials** Properties and Changes	**Making connections:** Does the size of an asteroid affect the diameter of its impact crater?
Key skills	**Scientific Enquiry:** • Plan and conduct fair tests (e.g., comparing materials for conductivity) • Make and test hypotheses **Practical Skills:** • Use a range of tools (e.g., circuit components, graduated cylinders) for precise measurements • Record findings with increasing precision, using tables and graphs **Analysis and Communication:** • Draw conclusions based on evidence and explain patterns • Use scientific vocabulary fluently to describe and report findings					
Key knowledge (Overarching)	*At this stage, children refine their ability to think scientifically, use evidence, and carry out more complex investigations. They deepen their knowledge of materials, forces, and life sciences while beginning to explore abstract scientific concepts* **Advanced Living Things and Life Processes:** • Understanding reproduction in plants and animals, human development, evolution, inheritance, adaptation, and the classification of living things **Properties and Changes of Materials:** • Investigating dissolving, reversible and irreversible changes, and properties like conductivity, transparency, and flexibility **Forces, Earth and Space, and Energy:** Exploring gravity, air and water resistance, levers and pulleys, the solar system, the movement of planets, and how light and electricity behave in circuits					

Key knowledge (Topic specific)	The **human circulatory system** includes the heart, blood vessels, and blood. The heart pumps blood, blood vessels transport it, and blood carries oxygen and nutrients around the body. A person's **lifestyle**, including diet, exercise, and avoiding harmful substances like drugs, has a big impact on how well their body functions. **Heart rate** (beats per minute) increases during exercise because the body needs more oxygen and nutrients. **Scientists throughout history** have developed methods and tools that led to modern scientific discoveries	**Some substances dissolve in liquids** to form a solution, like sugar in water. **Temperature and stirring** can affect how quickly a substance dissolves in a liquid. **Sieving, filtering, and evaporation** are methods used to separate solids and liquids. **Sieving** is used to separate larger solid particles from liquids or powders. **Filtering** separates solids from liquids, while **evaporation** removes the liquid, leaving the solid behind.	The **Sun** is a star at the center of our Solar System, with the **Earth and other planets orbiting it**. The **Moon orbits the Earth**, while moons of other planets, like Jupiter's moons, also orbit their planets. The **tilt of the Earth** and its orbit around the Sun cause the seasons, while the **Earth's rotation** causes day, night, and the Sun's apparent movement across the sky. The **Sun, Earth, and Moon** are all spherical, and the planets in the Solar System follow a specific order based on their distance from the Sun. **Scientific knowledge has changed over time**,	**Some substances dissolve in liquids** to form a solution, like sugar in water. **Temperature and stirring** can affect how quickly a substance dissolves in a liquid. **Sieving, filtering, and evaporation** are methods used to separate solids and liquids. **Sieving** is used to separate larger solid particles from liquids or powders. **Filtering** separates solids from liquids, while **evaporation** removes the liquid, leaving the solid behind.	**Material Properties**: Materials can be described by properties such as hardness, solubility, transparency, conductivity, and their response to magnets. **Reversible Changes**: Processes like dissolving, mixing, and changes of state (e.g., melting or freezing) are reversible. **Irreversible Changes**: Some processes, such as burning, rusting, or reactions like acid on bicarbonate of soda, result in new materials and are usually irreversible. **Understanding Materials**: The behaviour of materials during physical or chemical changes helps determine their	**The Earth and other planets** move around the Sun, and the **Sun, Earth, and Moon** are all spherical bodies. **Life cycles** differ across species, with mammals, amphibians, insects, and birds having unique stages in their reproduction and development. **Materials** can be grouped based on properties like hardness, solubility, transparency, conductivity, and magnetism. **Gravity** causes unsupported objects to fall towards Earth, while **air resistance, water resistance, and friction** affect moving objects. **Mixtures** can be separated using methods like **filtering, sieving, and evaporation**, based on the properties of solids, liquids, and gases.

	and a deeper understanding of the circulatory system and health. Science is constantly evolving, with new research making headlines, linking to **spiritual, moral, and cultural issues**, and inspiring careers like doctors, researchers, and fitness experts.		from historical discoveries to modern methods, with collaboration and learning from mistakes playing key roles in progress. **Current research and discoveries** in space science, often featured in the news, aim to deepen our understanding of the universe, with famous scientists (past and present) inspiring careers in astronomy and beyond.		uses and applications. **Interaction with Forces**: The properties of materials influence how they interact with forces, such as conductivity for electrical currents or solubility in liquids.	
Key vocabulary	blood bloodstream blood vessels carbon dioxide circulatory system drug evaluate fair test heart heart rate oxygen pulse Carbon dioxide	celestial bodies Jupiter Mars Mercury Neptune orbit phase planet Pluto Saturn solar system spherical star Uranus Venus	anomaly evidence light ray line graph line of best fit luminous mean average non-luminous ray diagram relationship testable units	control variable dissolve evaporation filtering insoluble mixture sieving soluble solution variable	conductor electrical conductivity hardness hazard insulator irreversible change method reversible change rusting thermal conductivity	air resistance asteroid celestial bodies crater diameter force gravity hardness material property spherical

Week 1	Factors affecting health LO: To identify factors that affect our health and how to reduce their negative impact. LO: To evaluate sources of information.	Models of our Solar System LO: To compare the contributions of Ptolemy, Alhazen and Copernicus to models of the Solar system. LO: To pose testable questions about the solar system.	The pathway of light LO: To describe the pathway of light. LO: To use evidence to form conclusions.	Mixtures LO: To describe mixtures. LO: To research using a range of secondary resources.	Hardness LO: To determine the hardness of materials and link this to their uses. LO: To evaluate the hardness test to determine the degree of trust in the results	**Investigating asteroid craters – Planning** LO: To revise the units *Earth and space* and *Life cycles and reproduction*. LO: To plan a comparative test.
Week 2	The heart and circulatory LO: To summarise the key structures and purpose of the circulatory system.	Our Solar System LO: To describe the movement and shapes of the celestial bodies in our Solar System. LO: To develop a model to represent the Solar System.	See the light LO: To describe how we see. LO: To draw scientific diagrams.	Sieving LO: To explain the process of sieving. LO: To draw and annotate a diagram to explain a concept.	Transparency LO: To determine the transparency of different materials and link this to their uses. LO: To plan and draw a table of results.	**Investigating asteroid craters – Gathering data** LO: To revise the units *Unbalanced forces* and *Mixtures and separation*. LO: To gather and record data.
Week 3	Blood LO: To identify the key roles of blood. LO: To evaluate a model.	The Moon LO: To describe the movement of the Moon relative to the Earth. LO: To design and draw a table.	Measuring Shadows LO: To explain how shadows change. To pose questions	Filtering LO: To explain the process of filtering LO: To identify testable questions and how to answer them	Conductivity LO: To determine the conductivity of different materials and link this to their uses. LO: To write a detailed, organised method that is easy to follow.	**Investigating asteroids – Analysing, concluding and evaluating** LO: To revise the units *Separating mixtures* and *Unbalanced forces*. LO: To conclude and evaluate the investigation

Week 4	Heart rate LO: To explore the relationship between animal size and heart rate. LO: To interpret patterns in data.	Day and night LO: To explain the causes of day and night and the seasons. LO: To draw a diagram to explain day and night.	Reflecting Light LO: To investigate what affects the angle of the reflected ray. LO: To record results as a line graph.	Solutions LO: To describe solutions and how they can be identified. LO: To make observations about solutions.	Reversible Changes LO: To demonstrate reversible changes. LO: To write a prediction using prior knowledge of the states of matter.	N/A
Week 5	Investigating exercise and heart rate LO: To investigate the relationship between exercise and heart rate. LO: To write a method.	Time LO: To devise a sundial to tell the time. LO: To calibrate and use a sundial to measure time.	Making a Periscope LO: To make a periscope To explain how a periscope works	Dissolving LO: To identify which factors affect the time taken to dissolve. LO: To plan a fair test with consideration of variables and measurements.	Irreversible changes: Burning and rusting LO: To demonstrate irreversible changes. LO: To analyse observations about rusting and use them to support a conclusion.	N/A
Week 6	Heart rate and fitness LO: To describe the relationship between heart rate and fitness. LO: To draw a line graph	Satellites and space junk LO: To describe some uses of satellites and the problems posed by space junk. LO: To use temperature data to make predictions about climate change.	Using Mirrors LO: To explain how mirrors are helpful. LO: To explore different jobs or inventions that depend on reflection.	Evaporating LO: To describe the process of evaporation. LO: To make observations and evaluate our predictions	Irreversible changes: Mixing LO: To demonstrate irreversible changes. LO: To measure the circumference of a balloon accurately.	N/A