St James' Church of England Primary School and Nursery

Science Curriculum Map 2024-2025

	Autumn 1 2024 – National Curriculum objectives covered with scaffolding from PLAN matrices.
Year 1	Materials – Use of everyday materials (Year 1)
Year 2	Materials
Year 3	Animals: Movement and nutrition
Year 4	Animals: Classification and changing habitats
Year 5	Unbalanced forces ** unit to be covered in connection with Earth and Space due to missed objectives and curriculum change
Year 6	Living things: Evolution and inheritance

Starting October 2024 – using Kapow to support the teaching of Science

	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1 Strand	Animals – Comparing Animals (Year 1)	Investigative science through stories	Introduction to Plants	Forces and Space – Seasonal Changes (Year 1)	Animals including Humans – Sensitive Bodies (Year 1)
Year 1 Objectives	Pupils who are **secure** will be able to: • Name and describe the physical features of a range of animals. • Sort animals into groups based on their similarities and differences. • Identify characteristics specific to mammals, birds, reptiles, amphibians and fish. • Recall the diets of carnivores,	Pupils who are **secure** will be able to: • Identify the typical weather associated with each season. • Describe animal features. • Recognise similarities and differences between animals in the same animal group. • Build an animal home with natural materials. • Explain the difference between carnivores,	• Pupils who are **secure** will be able to: • Identify plants and their features. • Recall some of the roles that flowering plant parts have. • Name some trees and their parts. • Identify similarities and differences between deciduous and evergreen leaves.	Pupils who are **secure** will be able to: • Name the four seasons in order and describe the typical weather in each. • Name some activities and events in the four seasons. • Describe the appearance of a tree's leaves in each season. • Recall that summer has the most daylight hours and winter has the least daylight hours. • Record data about the temperature across the four seasons.	Pupils who are **secure** will be able to: • Draw and label human body parts. • Identify the body parts associated with each sense. • When working scientifically, pupils who are **secure** will be able to: • Compare and group body parts. • Begin to recognise patterns in data and use these to answer questions. • Record data in a table.

	herbivores and omnivores. When working scientifically, pupils who are **secure** will be able to: • Use a non-fiction text to find out about specific animals' diets. • Recognise that there are different ways to gather data. • Record data in a block graph and use this to answer questions. • Recognise what the scientist Jane Goodall was known for. • Recall some of Jane Goodall's key findings.	herbivores and omnivores. When working scientifically, pupils who are secure will be able to: • Carry out online research to find answers to questions. • Measure length in centimetres. • Suggest how to carry out a waterproof test. • Begin to recognise if a test is fair. • Use data to answer questions. • Recognise patterns in data. • Group birds according to their diet.	• Recall that seeds and bulbs come from plants. • Recognise that seeds need water for growth. When working scientifically, pupils who are **secure** will be able to: • Raise questions about plants and respond to suggestions on how to set up an investigation to answer a question. • Use a magnifying glass to observe the different parts of flowering plants. • Draw and label a diagram of a flowering plant. • Use an identification chart to name flowering plants. • Sort plants into groups based on specific criteria. • Use non-standard units to measure leaf length.	• Label a map of the UK with capital cities and seasonal weather symbols. When working scientifically, pupils who are **secure** will be able to: • Complete a pictogram and use it to answer simple questions. • Record data about the temperature across the four seasons.	• Measure using non-standard units.

			• Recognise similarities and differences in seeds and bulbs. • Recognise that predictions do not always match observations. • Identify which plant parts can be eaten. • Recognise that scientific research into plants leads to important discoveries.		
	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 2 Strand	Living Things and their Habitats	Animals: Life cycles and health	Plants: Plant growth	Living things: Microhabitats	Making connections: Plant-based materials (reduce, reuse, recycle – protecting our oceans)
Year 2 Objectives	Pupils who are secure will be able to: • Ask questions to further their knowledge. • Recall some life processes, giving examples of how they apply to plants and animals. • Classify objects into alive, never been alive and was once alive, giving reasons for their choices. • Match different plants and animals to their habitats. • Give examples of how animals use their	Pupils who are secure will be able to: • Identify stages in the life cycles of different animals, including humans. • Describe the basic survival needs of animals. • Explain how to take care of personal hygiene. • Describe some positive effects of exercise. • Identify foods in different food groups. When working scientifically, pupils who are secure will be able to:	Pupils who are secure will be able to: • Recall that seeds have all the necessary parts inside for plants to grow. • Recall that seeds need water and warmth to germinate. • Recognise that light is required for healthy plant growth. • Sequence the stages of a plant's life cycle. • Recognise the importance of	Pupils who are secure will be able to: • Identify and name a variety of plants and animals. • Recall that minibeasts live in microhabitats. • Describe microhabitats and their conditions. • Describe how microhabitats provide for the basic needs of animals and plants. • Describe the job role of a botanist. • When working scientifically, pupils who are secure will be able to:	Pupils who are secure will be able to: • Explain the terms reduce, reuse and recycle. • Describe how paper is made. • Select suitable materials for a plant pot. • Describe good growth conditions for seeds. • Make a plant pot from eco-friendly materials. • Identify non-living materials to decorate a plant pot. • When working scientifically, pupils

	habitat for food and shelter. • Recall that plants produce their own food for energy. • Name living things that are producers and place a producer at the beginning of a food chain. • Use arrows to show the order in a food chain.	• Measure using simple equipment. • Record results in a table. • Use data to answer a simple question. • Research using secondary sources.	healthy plant growth. • Describe the influences humans have on plants in the environment. • When working scientifically, pupils who are **secure** will be able to: • Set up comparative tests. • Plan observations and measurements. • Use rulers to measure and record stem height. • Record plant growth data in a table. • Compare plant growth in different test conditions. • Use a magnifying glass to observe and compare plants. • Draw diagrams to represent stages of a plant's life cycle.	• Group minibeasts and create simple classification keys. • Ask questions and recognise that they can be answered in different ways. • Gather and record data and use it to answer questions. • Plan what observations to make in an experiment. • Order the steps of a method. • Describe the appearance of flowering plants. • Use an identification chart to name flowering plants.	who are secure will be able to: • Use an online source to find answers to questions. • Identify and classify different types of material. • Classify natural and human-made materials. • Carry out tests to assess the properties of different materials. • Use observations to answer questions. • Draw conclusions about the suitability of materials.
	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 3 Strand	Making connections: Does hand span affect grip strength?	Light and shadow	Materials: Rocks and soil (Linked with Roman Roads)	Plants: Plant reproduction	Forces and space: Forces and magnets
Year 3 Objectives	Pupils who are **secure** will be able to: • Recall key knowledge from previous units. • Apply knowledge in new contexts. • When working scientifically, pupils	Pupils who are **secure** will be able to: • Recall examples of light sources, objects that do not give out light and	• Pupils who are **secure** will be able to: • Define the term 'rock'. • Describe the appearance of different rocks; identifying both	• Pupils who are **secure** will be able to: • Identify what plants need to grow healthily. • Describe the structure and function of the parts of flowering plants.	• Pupils who are **secure** will be able to: • Identify examples of pushes, pulls and twists. • Define a force, including describing, naming and

	who are **secure** will be able to: • Carry out a full scientific enquiry.	that darkness is the absence of light. • Describe ways to protect eyes from harm. • Describe what happens when light reflects, give examples of reflective surfaces or materials and describe factors that may affect the quality of a reflected image. • Describe how shadows form and identify patterns between groups of materials and the shadows produced. • Recall factors that affect the way a shadow appears, including what causes shadows to change throughout the day and factors that change the size of a shadow • Describe the pattern of changing shadows throughout the day. • Describe how the light source's	crystals and grains. • Group rocks by their absorbency, hardness and reaction to acid rain (vinegar). • List the different factors that break down rocks. • Describe fossil formation and identify fossils in rocks. • Describe the work of a palaeontologist. • Name, describe and compare some different categories of soil. • List some of the benefits of earthworms to the soil. • Identify and describe the comparative size and weight of the layers in a sedimentation jar. • When working scientifically, pupils who are **secure** will be able to: • Use a magnifying glass correctly to observe the appearance of a rock in detail. • Use results to choose the appropriate rock type for a specific use, suggest a	• Investigate how plants transport water. • Describe the life cycle of a flowering plant. • Explain seed dispersal methods. • When working scientifically, pupils who are **secure** will be able to: • Pose relevant questions. • Design and record in results tables. • Plan a simple enquiry. • Complete, read and interpret data in a bar chart. • Identify and suggest changes to an enquiry. • Use results to draw conclusions.	classifying contact and non-contact forces. • Describe the relationship between friction and the roughness of a surface. • Identify examples of friction being useful or not. • Predict attraction and repulsion between like and opposite poles. • Identify examples of magnetic and non-magnetic materials. • Name some examples of types of magnets and compare their strengths. • Describe some examples of the uses of magnets. • When working scientifically, pupils who are **secure** will be able to: • Use arrows and scientific vocabulary to show the direction of a contact force. • Use evidence to support conclusions. • Identify the variables to change, measure and control. • Write a method to explain how to use a magnet to sort and classify materials as magnetic or non-magnetic.

		distance affects the shadow's size. • Explain why a particular material is appropriate to make a shadow puppet and use knowledge of shadows to animate it. When working scientifically, pupils who are **secure** will be able to: • Recall what information needs recording to decide the number of columns in a results table and suggest suitable headings for the results table. • Record information in the correct columns. • Identify if a question is testable, explain why and plan ways to answer a testable question. • Identify and explain why something is an advantage or disadvantage of a method and suggest an	better choice of rock for a specific use and to predict how a rock will be affected by the weather. • Research and present information on fossil formation using a single source. • Use a model of the fossil record to determine the relative age of a fossil, to suggest how a living thing has changed over time and to suggest what living things were around in a certain era. • Draw and label the bars on a bar chart. • Accurately draw and label the layers of sediment in a sedimentation jar.		• Label the axes of a bar chart. • Draw bars on a chart accurately. • Identify key information from a source. • Use more than one source to research a question. •

		improvement to the experiment. • describe patterns in data and quote values as evidence of patterns in data. • identify odd results that do not fit the pattern. • use patterns to make predictions for missing data.			
	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 4 Strand	Energy: Sound and vibrations	States of Matter	Energy: Electricity and circuits	Making connections: how does the flow of liquids compare?	Animals: Digestion and food
Year 4 Objective	• Pupils who are **secure** will be able to: • Describe how sounds are made. • Describe how sounds are heard through different mediums. • Explain the relationship between vibration strength and volume. • Describe the relationship between volume and distance. • Describe pitch and how to change it. • Explain how insulating materials can be used to muffle sound. • When working scientifically, pupils who are **secure** will be able to: • To observe closely how different	• Pupils who are **secure** will be able to: • Identify solids, liquids and gases using their properties. • Describe melting, freezing, condensing and evaporating. • Describe the different stages of the water cycle. • Describe how temperature affects the rate of evaporation and therefore the water cycle. • When working scientifically, pupils who are **secure** will be able to: • Ask relevant questions. • Use results to draw simple conclusions.	• Pupils who are **secure** will be able to: • Recall a range of electrical appliances and classify them as mains or battery-powered. • Explain why something is either mains or battery-powered. • Explain how to test if a circuit works and identify when simple electric circuits will work. • Identify symbols for open and closed switches. • Predict whether a circuit will work based on whether the switch is open or closed and explain that it works by breaking and	Pupils who are **secure** will be able to: • Recall key knowledge from previous units. • Apply knowledge in new contexts. When working scientifically, pupils who are **secure** will be able to: • Carry out a full scientific enquiry.	• Pupils who are **secure** will be able to: • Label key organs found in the digestive system and describe each of their functions. • Describe the functions of the four different types of adult, human teeth, using key vocabulary. • Know that good dental care involves brushing their teeth twice a day with toothpaste and a soft toothbrush. • Produce a food chain that begins with a plant and has arrows that move up the food chain. • Define a producer, predator and prey and identify

	instruments create a sound. • Research how whales and dolphins communicate underwater. • Present results using a bar chart. • Suggest which variables to measure and for how long. • Design simple results tables. • Identify when results or observations do not match predictions. •	• Use thermometers to take accurate measurements. • Make predictions for new values. • Record findings using labelled diagrams. • Research using more than one source	completing a circuit. • Give examples of how switches are useful. • Describe that a material is a good electrical conductor when it is added to an electric circuit and the bulb lights. • Describe that a material is a good electrical insulator when it is added to an electric circuit and the bulb does not light. • Recall that metals, for example, are good electrical conductors and plastics, for example, are good electrical insulators. • Describe that the more bulbs added to a series circuit, the dimmer the bulbs will be. • Explain that the bulbs will be dimmer when more are added to a circuit, as less energy is transferred to each of them. • Describe precautions for working safely with electricity. • Explain some precautions using knowledge of circuit		examples in food chains. • Describe digestion, teeth and diets when talking about the observed poo clues. • Write a letter that uses a range of scientific vocabulary from the unit. • • When working scientifically, pupils who are **secure** will be able to: • Evaluate a strength or weakness of the digestive system model. • Describe an example of evidence that can be used to study teeth. • Identify some of the variables that need to be kept the same, predict an outcome and identify limitations to the experiment. • Recall that scientific research needs repeated results before use in society. • Identify trends in a predator-prey graph. • Draw a results table that has space for observations about different poo samples.

			diagrams, electrical components, conductors or insulators. • When working scientifically, pupils who are **secure** will be able to: • Draw a results table and record a range of appliances under the correct headings 'Mains' or 'Batteries'. • Identify and draw simplified electric circuit symbols and use these to draw a simplified circuit diagram. • Write a method for the investigation that considers appropriate equipment, ordering clearly written steps and considering safety. • Pose questions relating to bulbs in an electrical circuit. • Explain why a selected question is testable. • Suggest that new inventions will change safety advice.		
	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 5 Strand	Materials: Properties and changes	Forces and space: Earth and space	Animals: Human timeline	Materials: Mixtures and separation	Living things: Life cycles and reproduction

Year 5 Objectives	• Pupils who are **secure** will be able to: • Determine the hardness of different materials and link this to their uses. • Determine the transparency of different materials and link this to their uses. • Determine the thermal and electrical conductivity of different materials and link this to their uses. • Demonstrate, identify and describe reversible and irreversible changes. • When working scientifically pupils who are **secure** will be able to: • Evaluate the hardness test to determine the degree of trust in the results. • Plan and draw a table of results. • Write a detailed, organised and easy to follow method. • Write a prediction using prior knowledge of the states of matter. • Analyse observations about rusting and use them to support a conclusion.	• Pupils who are **secure** will be able to: • Describe the geocentric and heliocentric models. • Name and describe the shape of celestial bodies. • Describe the orbits of celestial bodies in the Solar System and name the force that keeps them in their orbits. • Describe the orbit of the Moon around the Earth and its phases. • Explain how day and night occur. • Explain how the seasons occur. • Explain how a sundial works. • List some of the uses of satellites and explain why space junk poses a problem to them. • When working scientifically, pupils who are **secure** will be able to: • Pose and identify testable questions about the movement of the celestial bodies in our Solar System. • Use a model to represent the Solar System.	• Pupils who are **secure** will be able to: • Order the stages in growth and development from birth to old age. • Describe physical and developmental changes from a baby through to old age. • Describe changes that occur in males and females during puberty. • Suggest ways to manage the changes that occur during puberty. • Recall what is meant by a gestation period. • Describe how gestation varies across animals and compare this to humans. • When working scientifically, pupils who are **secure** will be able to: • Use data to describe growth from baby to adult. • Identify where on the graph the rate of growth changes. • Use a line graph to make predictions about height. • Choose a suitable title and axes labels for the scatter graph and plot data	• Pupils who are **secure** will be able to: • Define the term **mixture** and name some common examples. • Define the term **sieving** and explain how sieving separates mixtures. • Define the term **filtering** and explain how filtering separates mixtures. • Define the terms **solution** and **dissolve** and name some common examples of solutions. • Recall some factors that affect the time taken to dissolve. • Describe the effect of temperature on the time taken to dissolve. • Define the term **evaporating** and explain how evaporating separates solutions. • Identify when sieving, filtering and evaporating should be used. • When working scientifically pupils who are **secure** will be able to: • Research a mixture to find out what substances it is made from. • Draw and annotate a diagram to explain how sieving separates a solid-solid mixture.	• Pupils who are **secure** will be able to: • Describe the life cycle of a plant, including the reproductive stage. • Describe the life cycle of a mammal. • Describe the life cycle of a bird and compare it with that of a mammal. • Describe the life cycle of an amphibian. • Describe the life cycle of an insect and compare it with that of an amphibian. • Describe asexual reproduction in plants. • When working scientifically, pupils who are **secure** will be able to: • Observe and compare equivalent parts in different flowers. • Research the life cycles of different mammals. • Pose questions to compare the life cycles of different birds. • Suggest how one temperature may affect egg hatching. • Use data to describe a relationship and make predictions.

	• Measure accurately in centimetres. •	• Design and draw a table to record data on moons. • Accurately draw day and night and seasons diagrams. • Calibrate a sundial using a compass and torch and use it to measure time. • Analyse patterns in temperature data for the Earth and use them to predict temperature values for the Earth in the future.	on the scatter graph.	• Identify and justify which type of enquiry to use to answer my testable question. • Identify solutions by observing and describing their appearance. • Suggest which variables to change, measure and control when investigating how temperature affects the time taken to dissolve. • Choose which measurements to take and how long to take them for.	• Represent root growth over time on a line graph.
	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 6 Strand	• Living things: Classifying big and small	• Energy: Circuits, batteries and switches (sirens link)	• Energy: Light and reflection	• Making connections: Are some sunglasses safer than others?	• Animals: Circulation and health
Year 6 Objectives	• Pupils who are **secure** will be able to: • Define the term 'organism' and name the seven life processes of all living things. • Describe the work of Carl Linnaeus. • Define the term 'vertebrate' and name the vertebrate groups. • Describe the characteristics of fish, amphibians, reptiles, birds and mammals. • Compare the characteristics of the vertebrate groups. • Define the term 'invertebrate'.	• Pupils who are **secure** will be able to: • Describe the function of key electrical components and explain how the models used in the lesson represent these. • Correctly predict if an electrical circuit will work or not, explaining why using their knowledge of complete loops, power sources and presence of components. • Describe the relationship between the number of bulbs in a circuit, the bulb	• Pupils who are **secure** will be able to: • Compare sources of light and explain how the eye is protected from light. • Describe how light travels and how we see luminous and non-luminous objects. • Recall factors that affect the size of a shadow and describe how the distance between an object and the surface its shadow is cast on affects the size of the shadow.	• Pupils who are **secure** will be able to: • Recall key knowledge from previous units. • Apply knowledge in new contexts. • • When working scientifically, pupils who are **secure** will be able to: • Carry out a full scientific enquiry.	• Pupils who are **secure** will be able to: • Recall factors that improve someone's health and those that impact health negatively and suggest improvements to someone's health. • Describe the circulatory system as the heart and blood vessels transporting blood around the body and recall that the heart is a pump that pushes blood through the circulatory system. • Describe the pathway of blood through the

	• Describe the characteristics of worms, snails, spiders and insects. • Compare the characteristics of the invertebrate groups. • Name the plant groups. • Describe the characteristics of flowering plants, ferns, mosses and conifers. • Define the term 'micro-organism' and name some examples. • When working scientifically pupils who are **secure** will be able to: • Use a classification key to group and identify organisms. • Make a simple classification key. •	brightness and the amount of resistance. • Explain that increasing the number of components increases the resistance, affecting the flow of current and energy transferred. • Identify that batteries are a voltage source; they come in different voltages, affecting bulb brightness. • Describe that voltage can be changed using different numbers of cells in a circuit and that more cells or a higher voltage causes brighter bulbs. • Use the relationship between voltage and bulbs to predict what will happen with buzzers and motors. • Build an electrical circuit with a switch to control its function, explain how the switch and the electrical circuit solve the problem and recall different examples of problems that can be solved using an electrical circuit. • When working scientifically, pupils	• Use ray diagrams to explain why shadows change size and why the shape of a shadow matches the object that cast it. • Recall what happens to light when it reaches a smooth mirror surface. • Identify the incoming and reflected rays and describe the relationship between their angles. • Use mirrors to make a working periscope and explain how a periscope works using ray diagrams. • Recall a range of uses of mirrors and reflection and describe how a mirror reflects light in different situations. • Explain how light is reflected using knowledge of light and reflection. • When working scientifically, pupils who are **secure** will be able to: • Make observations about the properties of light.		circulatory system, including passing through the heart twice in a complete circuit through the body. • Describe some of the functions of blood, including transporting substances like oxygen, water and nutrients around the body. • Recall what is meant by heart rate and research using multiple websites to find reliable animal masses. • Identify the pattern between animals' size and heart rate and quote values as evidence. • Describe how different exercises affect heart rate and explain why heart rate changes during exercise. • Describe what happens to heart rate during and after exercise and compare two sets of heart data to identify a link between heart rate and fitness. • When working scientifically, pupils who are **secure** will be able to: • Evaluate the trustworthiness of secondary sources

		who are **secure** will be able to: • Draw circuit diagrams with straight lines and using standard circuit symbols. • Design a results table with an appropriate number of columns and headings with units. • Identify the changed, measured and control variables in an enquiry to plan a method.	• Use my observations as evidence to support conclusions about light. • Draw ray diagrams. • Pose testable questions in response to observations. • Record my measurements as a line graph. • Use my line graph to extrapolate data and make predictions about missing values. • Recall various jobs or inventions that use mirrors and reflection.		that provide health advice. • Evaluate the model blood by considering a strength and a weakness when representing blood and suggesting improvements. • Compare class values and recognise when they do not match. • Use identified patterns to predict new values. • Write a method for an enquiry with consideration of equipment, the different versions of the changed variable and how to complete the measured variable. • Choose a suitable title and axis labels with units for the line graph and plot points on the line graph.