

Y1/2	Key Skills	Key knowledge	Outcomes
Autumn Term 1 Animals, including humans: Sensitive bodies Identifying and naming body parts and conducting practical activities with the senses to spot patterns and answer questions.	Posing questions - Recognising there are different types of enquiry (ways to answer a question). Observing (qualitative data) - Using their senses to describe, in simple terms, what they notice or what has changed. Measuring (quantitative data) - Using non-standard units to measure and compare. Recording (diagrams) - Drawing and labelling simple diagrams. Recording (tables) - Using a prepared table to record results, including numbers and simple observations. - Grouping and classifying Grouping based on visible characteristics. - Analysing and drawing conclusions - Using their results to answer simple questions.	To know: - The key parts of the human body (including head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth and teeth). The five main senses: sight, smell, hearing, taste and touch. The skin is used for touch, the tongue is used for taste, the nose is used for smell, the eyes are used for sight, and the ears are used for hearing. Science in action To know: - A range of jobs and careers that use scientific knowledge and methods. - About the work of modern-day scientists. There are spiritual, moral, social and cultural links with Science.	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. - Measure using non-standard units.
			Key Vocabulary
			compare, group, hearing, pattern, sense(s), sight, smell, taste, touch
Autumn Term 2 Materials: Everyday materials Comparing and grouping materials based on their properties.	Posing questions - Responding to suggestions on how to answer questions. Planning - Beginning to recognise whether a planned test is fair. With support, deciding if suggested observations are suitable. Predicting - Suggesting what might happen, often justifying with personal experience. Observing (qualitative data) - Using their senses to describe, in simple terms, what they notice or what has changed. Recording (tables) - Using a prepared table to record results including simple observations. Grouping and classifying - Grouping based on visible characteristics. Analysing and drawing conclusions - Using their results to answer simple questions. Beginning to recognise when results or observations do not match their predictions.	To know: - Objects are items or things. - A material is what an object is made from. - A variety of everyday materials, including wood, plastic, glass, metal, water and rock. - Property refers to how a material can be described. - Materials can be grouped based on their physical properties.	Pupils who are secure will be able to: - Name objects and identify the materials they are made from. - Recognise that objects are made from materials that suit their purpose. - Recall that a property is how a material can be described. When working scientifically, pupils who are secure will be able to: - Sort objects based on the materials they are made from. - Group objects based on their properties. - Suggest ways to test materials for their properties. - Make predictions and recognise whether they were accurate. - Use their observations to answer questions. - Begin to recognise if a test is fair.
			Key Vocabulary
			absorbent, fabric, glass, group, material, metal, object, plastic, rock, tough, waterproof, wood
Spring Term 1 Animals, including humans: Comparing animals Comparing and grouping animals based on similarities and differences in their characteristics, physical features and diets.	Posing questions - Recognising there are different types of enquiry (ways to answer a question). - Responding to suggestions on how to answer questions. Planning - Deciding if suggested observations are suitable, with support. Observing (qualitative data) - Using their senses to describe, in simple terms, what they notice or what has changed. Researching - Gathering specific information from one simplified, specified source. Recording (diagrams) - Drawing and labelling simple diagrams. Grouping and classifying - Grouping based on visible characteristics. Graphing - Representing data using pictograms and block charts. Analysing and drawing conclusions - Using their results to answer simple questions.	To know: - A variety of common animals (including fish, amphibians, reptiles, birds and mammals). - The main body parts of common animals (arms, legs, wings, tails, fins, head, trunk, horns, tusks and shell). - A carnivore is an animal that eats other animals and to give some examples. - A herbivore is an animal that eats only plants and to give some examples. - An omnivore is an animal that eats both animals and plants and to give some examples. Science in action To know: - About famous scientists throughout history.	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, 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.
			Key Vocabulary
			amphibian, bird, carnivore, compare, diet, difference, fish, group, herbivore, mammal, observe, omnivore, reptile, scientist, similarity

Spring Term 2 Materials: Uses of everyday materials Comparing the suitability of materials by carrying out tests and recording data.	Posing questions - Recognising there are different types of enquiry (ways to answer a question). Measuring (quantitative) - Using non-standard units to measure and compare. Recording (tables) - Using a prepared table to record results, including numbers. Grouping and classifying - Grouping based on visible characteristics. Graphing - Representing data using pictograms and block graphs. Analysing and drawing conclusions - Using their results to answer simple questions.	To know: - Objects are made from materials that suit their uses. - One material can be used for a range of purposes. - Different materials can be used for the same purpose. - A push or pull must be applied to change the shape of a solid object. - Solid objects can be stretched, twisted, bent or stretched. - Different solid objects may take different amounts of force to change shape. Science in action To know: - A range of jobs and careers that use scientific knowledge and methods. - Science in the news and recent discoveries. - Spiritual, moral, social and cultural links with science.	Pupils who are secure will be able to: - Name objects with the same use that are made from different materials. - Name materials that are used to make objects with different uses. - Recognise that stretching, twisting, bending and squashing can cause some solid objects to change shape. - Name properties that make materials suitable for their use. When working scientifically, pupils who are secure will be able to: - Measure using non-standard units. - Recording results in a table. - Use data to answer a simple question. - Record results in a block graph. Key Vocabulary elastic, fabric (Y1), flexible, glass (Y1), material (Y1), metal (Y1), object (Y1), plastic (Y1), property, rock (Y1), suitable, wood (Y1)
Summer Term 1 Living things: Microhabitats Asking questions about minibeasts and using scientific enquiry methods to find answers.	Posing questions - Exploring the world around them and raising their own simple questions. Recognising that there are different types of enquiry (ways to answer a question). Responding to suggestions on how to answer questions. Planning - With support, deciding if suggested observations are suitable. Ordering a simple method. Predicting - Suggesting what might happen, often justifying with personal experience. Observing (qualitative data) - Using their senses to describe, in simple terms, what they notice or what has changed Researching - Gathering specific information from one simplified, specified source. Recording (tables) - Recording results using simple observations and tally frequency. Classification keys - Organising questions to create a simple classification key. Analysing and drawing conclusions - Using results to answer simple questions. - Beginning to recognise when results or observations do not match their predictions.	To know: - A variety of plants and animals and describe some differences. - A habitat is the environment where an animal or plant lives/grows because it provides what they need to survive. - A microhabitat is a very small habitat (e.g. under stones, logs and leaf litter). - That living things depend upon each other (e.g. for food or shelter).	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: - 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. Key Vocabulary food chain, microhabitat, minibeast, research, results, test
Summer Term 2 Making connections: Fairytale science Consolidating knowledge of materials and animals through fairytales and practical investigations.	Planning - Beginning to recognise whether a planned test is fair. With support, deciding if suggested observations are suitable. Predicting - Suggesting what might happen, often justifying with personal experience. Observing (qualitative data) - Using their senses to describe, in simple terms, what they notice or what has changed. Measuring (quantitative data) - Beginning to use standard units and read simple scales to measure and compare. Beginning to use simple measuring equipment to make approximate measurements. Recording (tables) - Using a prepared table to record results, including: - numbers; simple observations. Grouping and classifying - Grouping based on visible characteristics. Analysing and drawing conclusions - Using their results to answer simple questions. Beginning to recognise when results or observations do not match their predictions.	Animals, including humans To know: - A variety of common animals (including fish, amphibians, reptiles, birds and mammals). - The main body parts of common animals (arms, legs, wings, tails, fins, head, trunk, horns/tusks and shell). - The five main senses: sight, smell, hearing, taste and touch. Skin is used for touch, the tongue is used for taste, the nose is used for smell, the eyes are used for sight and the ears are used for hearing. Living things and their habitats To know: - A habitat is the environment where an animal or plant lives/grows because it provides what they need to survive.	Pupils who are secure will be able to: - Compare and describe animal features. - Describe the properties of everyday materials. - Use natural materials to build a gingerbread man home. - Use the senses to observe and describe. When working scientifically, pupils who are secure will be able to: - Use a stopwatch to measure and compare. - Order a simple method. - Plan how to carry out a test. - Decide what observations to record. - Show results in a block graph. Key Vocabulary absorbent, amphibian, bird, compare, difference, fish, group, hearing, mammal, material, measure, object, observe, predict, property, research, reptile, sight, similarity, smell, suitable, table, taste, test, touch, waterproof

Y3/4	Key Skills	Key knowledge	Outcomes
Autumn Term 1 Energy: Light and shadows Exploring the link between light and darkness, observing reflections and investigating different factors that affect shadows.	Posing questions - Beginning to raise further questions during the enquiry process. - Considering what makes a testable question. - Beginning to recognise that there are different types of enquiry and that they are suitable for different questions. - Beginning to make suggestions about how different questions could be answered. Planning - Beginning to select from options which variables will be changed, measured and controlled. Predicting - Making predictions about what they think will happen by using scientific knowledge and personal experience to explain their prediction.	To know: - Light travels from a source (e.g. the Sun, light bulbs and torches). - Light is needed to see things and that dark is the absence of light. - Light from the Sun can be dangerous and how to protect their eyes. - All materials reflect light. - Shadows form when the light from a light source is blocked by an opaque object. - Shadows change as a result of changing the position of the light source and changing the distances between the light source, object and surface. - Shadows change position and length throughout the day as the Sun changes position in the sky. Science in action To know: - Famous scientists throughout history. - A range of jobs and careers use scientific knowledge and methods. - There are spiritual, moral, social and cultural links with Science. - Methods and equipment used by scientists throughout history and how these have led to modern methods. - Scientific knowledge has changed over time, leading to the current understanding of Science. - Collaboration and peer reviewing are essential for effective scientific progress.	Pupils who are secure will be able to: - Recall examples of light sources, objects that do not give out light and 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 distance affects the shadow’s size. - Explain why a particular material is appropriate for making 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. - Select which variables will be changed, measured and controlled in the experiment. - I can describe patterns in data and quote values as evidence of patterns in data. - I can identify odd results that do not fit the pattern. - I can use patterns to make predictions for missing data.
			Key Vocabulary
			cast a shadow, conclusion, control variable, dangerous, light source, luminous, non-luminous, opaque, protect, prove, reflect, reflection, reflective (shiny), relationship, shadow, shadow puppet, translucent, transparent, variable

Autumn Term 2 Animals, including humans: Movement and nutrition Exploring the role of skeletons and muscles, learning how the body uses energy and what constitutes a balanced diet.	Measuring - Using standard units to measure and compare. - Using measuring equipment with increasing accuracy. - Reading scales with unmarked intervals between numbers. Researching - Gathering specific information from a variety of sources. Recording - Using a prepared table to record results including more detailed observations. Grouping and classifying - Grouping based on visible characteristics and measurable properties. Analysing - Writing a conclusion to summarise findings using simple scientific vocabulary. Evaluating - Beginning to identify new questions that would further the enquiry.	To know: - Animals can be grouped based on the presence of a skeleton. - The skeleton in humans and some animals is used for movement, protection and support. - The muscular system in humans and some animals works with the skeleton for movement. - The main bones in the body. - Animals, including humans, need the right types and amount of nutrition. Humans cannot make their own food; therefore, they eat to get the nutrition needed. - There are nutrient groups (carbohydrates, protein, fats, fibre, vitamins, minerals and water) that have their own functions in the body. - A balanced diet should include all nutrient groups. - Animals have different diets. Science in action To know: - There are famous scientists throughout history. - There are a range of jobs and careers that use scientific knowledge and methods. - Scientific work is taking place with modern-day scientists. - There are science events in the news and recent discoveries. - There are methods and equipment used by scientists throughout history that have led to modern methods. - Scientific knowledge has changed over time, leading to the current understanding of Science. - There is current scientific research taking place with aims for the future.	Pupils who are secure will be able to: - Recall the three key functions of the skeleton (movement, support and protection). - Describe a vertebrate, invertebrate, endoskeleton and exoskeleton. - Identify and name the skull, spine, ribs and pelvis on a diagram. - Recall that muscles cause movements in the body, some of which we control by choice and that they cause a movement by shortening and pulling on a bone. - Recall that animals, including humans, need to eat food to survive. - Describe some examples of how energy is used by the body and make comparisons about the energy demands between people. - List some of the seven nutrient groups, name foods that are good sources of them and describe what they are needed for in the body. - Compare two different meals and explain which is more balanced by naming the nutrient groups and commenting on the relevant proportions.
			Key Vocabulary
			balanced diet, bone, carbohydrate, conclude, diet, endoskeleton, energy, exoskeleton, fat, fibre, invertebrate, joint, measure, mineral, movement, muscle, nutrient, pelvis, protection, protein, ribs, skeleton, skull, spine, support vertebrate, vitamin

Spring Term 1 Materials: Rocks and soil Exploring the physical properties of rocks and soils and fossil formation.	Observing - Using their senses to describe, in more detail and with simple scientific vocabulary, what they notice or what has changed. Researching - Gathering specific information from a source. Recording - Beginning to draw more scientific diagrams by: - Drawing in 2D to produce simple line diagrams. - Labelling with more scientific vocabulary. Grouping and classifying - Grouping based on visible characteristics and measurable properties. Graphing - Representing data using bar charts. Analysing and drawing conclusions - Beginning to suggest how one variable may have affected another. - Beginning to quote results as evidence of relationships. - Beginning to use identified patterns to predict new values or trends.	To know: - Rocks can be grouped based on appearance or properties (e.g. colour, texture, hardness and permeability). - Rocks may contain grains, crystals or fossils. - Grains and crystals appear differently and can be used to classify rocks. - Soils are made from rocks and dead matter. - The relationship between the properties of rocks and their uses. - Fossils can form from the remains of living things. Rocks can change over time (e.g. erosion and weathering).	Pupils who are secure will be able to: - Define the term rock. - Describe the appearance of different rocks, identifying both 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 better choice of rock for a specific use and 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.
			Key Vocabulary
			bar chart, conclusion, crystal, diagram (Y1), fossil, grain, group (Y1), hard, hardness, observe (Y1), predict (Y2), record, research (Y2), rock, sediment, sedimentary rock, sedimentation, soft, soil
Spring Term 2 Animals, including humans: Digestion and food Exploring the role of the digestive system and comparing teeth and diets of different animals as part of a food chain.	Planning - Beginning to select from options which variables will be changed, measured and controlled. Recording - Beginning to design simple results tables. Grouping and classifying - Grouping based on visible characteristics and measurable properties. Analysing and drawing conclusions - Beginning to suggest how one variable may have affected another. - Beginning to use identified patterns to predict new values or trends. Evaluating - Beginning to identify steps in the method that need changing and suggest improvements. - Beginning to identify which variables were difficult to control and suggesting how to better control them. - Commenting on the degree of trust by reflecting on the quality of results (repeating results, accurate measurements and maintaining control variables).	To know: - The main organs of the human digestive system are the mouth, teeth, tongue, oesophagus, stomach, small and large intestines and each has a different function. - The different types of human teeth are incisors, canines, premolars and molars and each has a different function. - Teeth can be damaged by sugary and acidic food, for example. It is important to brush teeth twice a day, make good food choices and visit the dentist regularly. - The teeth of carnivores and herbivores are different for a reason. - Predators hunt for their food and prey are the animals being hunted. - Producers make their own food. Food chains begin with a producer, followed by consumers and arrows to show the energy passed on. Science in action To know: - Famous scientists throughout history. - There are a range of jobs and careers that use scientific knowledge and methods. - There is work taking place by modern-day scientists. - There are spiritual, moral, social and cultural links with science. - There are different methods and equipment used by scientists throughout history and these have led to modern methods. - Scientific knowledge has changed over time, leading to the current understanding of science.	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 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. - Evaluate a method by considering its limitations. - Recall that scientific research needs repeated results before being used in society. - Identify trends in predators and prey. - Draw a results table that has space for observations about different poo samples.
			Key Vocabulary
			Canine, carnivore (Y1), conclusion (Y3), control variable, diagram (Y1), digest, digestive system, ethics, faeces, food chain (Y2), fair test, group (Y1), herbivore (Y1), incisor, large intestine, molar, mouth, nutrient (Y3), oesophagus, omnivore (Y1), pattern (Y1), plan (Y1), predator (Y2), premolar, prey (Y2), producer, proof, record (Y3), results table (Y3), saliva, small intestine, stomach, trustworthy (Y3), variable (Y3)

Summer Term 1 Energy: Electricity and circuits Exploring electrical components and conductivity through circuit building and real-life applications.	Posing questions - Considering what makes a testable question. Beginning to recognise that there are different types of enquiry and that they are suitable for different questions. Beginning to make suggestions about how different questions could be answered. Planning - Planning a simple method, verbally and in writing. Beginning to write a simple method in numbered steps. Selecting and beginning to decide what simple equipment might be used to aid observations and measurements. Predicting - Making predictions about what they think will happen by predicting a trend by considering how the changing variable will affect the measured variable. Observing - Using their senses to describe, in more detail and with simple scientific vocabulary, what they notice or what has changed. Recording - Beginning to draw scientific diagrams that are in 2D and simple line diagrams. Using a prepared table to record results including more detailed observations. Using tables with more than two columns. Identifying and adding headings to tables. Beginning to design simple results tables. Grouping and classifying - Grouping based on visible characteristics and measurable properties. Analysing and drawing conclusions - Writing a conclusion to summarise findings using simple scientific vocabulary. Beginning to suggest how one variable may have affected another. Beginning to use identified patterns to predict new values or trends.	To know: - All electrical appliances need a power source, including batteries or mains electricity. - An electrical circuit needs a complete path for the electrical charge to flow through. - The main components in a series circuit. - There are precautions for working safely with electricity. - Some materials allow electric charge to pass through them quickly and these are known as electrical conductors (e.g. metals). - Some materials do not allow electrical charge to pass through them easily and these are known as electrical insulators (e.g. wood and plastic). - Metals are used for cables and wires because they are good conductors of electricity. - Plastic is used to cover cables and wires because it is a good insulator. - An open switch breaks a series circuit so the components will be off. - A closed switch completes a series circuit so the components will be on. - The relationship between bulb brightness and the number of bulbs in a circuit. Science in action To know: - There are famous scientists throughout history. - There are a range of jobs and careers that use scientific knowledge and methods. - Work is done by modern-day scientists. Methods and equipment have been used by scientists throughout history and these have led to modern methods. - Scientific knowledge has changed over time, leading to the current understanding of Science. - Collaboration and peer-reviewing are essential for effective scientific progress.	Pupils who are secure will be able to: - Recall a range of electrical appliances, classify them as mains or battery-powered and explain why. - Explain how to test if a circuit works and identify when simple electric circuits will work. - Identify symbols for open and closed switches and give examples of how switches are useful. - Predict whether a circuit will work based on whether the switch is open or closed and explain that it works by breaking and completing a circuit. - Describe that a material is a good electrical conductor when it is added to an electric circuit and the bulb lights and 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 and explain that they 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 and explain some precautions using knowledge of circuit 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, orders clearly written steps and considers 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.
			Key Vocabulary Appliance, battery/cell, bulb, buzzer, circuit, conclusion, electrical conductor, electrical insulator, electricity, mains, method, motor, pattern (KS1), power source, predict (KS1), property, results table, switch, wire, variable

Summer Term 2 Making connections: How does food affect muscle fatigue? Exploring the relationship between food consumption and muscle fatigue through scientific enquiry.	This unit revisits the working scientifically skills, including: Posing questions. Planning. Predicting. Observing. Measuring. Recording. Graphing. Analysing and drawing conclusions. Evaluating.	Movement and nutrition To know: • The skeleton in humans and some animals is used for movement, protection and support. • The muscular system in humans and some animals works with the skeleton for movement. • The main bones in the body Animals, including humans, need the right types and amount of nutrition. • Humans cannot make their own food and therefore eat to get the nutrition needed. • The main nutrient groups (carbohydrates, protein, fats, fibre, vitamins, minerals and water) and their simple functions. • A balanced diet should include all nutrient groups. Digestion and food To know: • The main organs of the human digestive system (mouth, teeth, tongue, oesophagus, stomach, small and large intestines) and describe their simple functions. • Food chains begin with a producer followed by consumers and arrows to show the energy passed on. Rocks and soil To know: • Soils are made from rocks and dead matter. Electricity and circuits To know: • All electrical appliances need a power source, including batteries or mains electricity. • An electrical circuit needs a complete path for the electrical charge to flow through. • The main components in a simple series circuit. • The precautions for working safely with electricity. • That some materials allow electrical charge to pass through them quickly and these are known as electrical conductors (e.g. metals). • A closed switch completes a series circuit so the components will be on. Light and shadows To know: • Light travels from a source (e.g. the Sun, light bulbs and torches). • Light is needed to see things and that dark is the absence of light. All materials reflect light. • Shadows are formed when the light from a light source is blocked by an opaque object.	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.
			Key Vocabulary
			bar chart, battery, bulb, circuit, conclusion, control variable, fair, joint, light source, opaque, pattern (KS1), predict (KS1), shadow, trustworthy, variable

Y5/6	Key Skills	Key knowledge	Outcomes
Autumn Term 1 Materials: Mixtures and separation Exploring different types of mixtures and the appropriate methods to separate them	Researching - Gathering answers to open-ended questions from a variety of sources. Recording (diagrams) - Labelling with a broader range of scientific vocabulary. - Annotating diagrams to explain concepts and convey opinions. Posing questions - Selecting the most appropriate enquiry method to answer questions and give justification. Observing (qualitative data) - Using their senses to describe, in detail and with a broader range of scientific vocabulary, what they notice or what has changed. Planning - Suggesting which variables will be changed, measured and controlled. - Making and explaining decisions about what observations to make and how long to make them for.	To know: - Some substances will dissolve in a liquid to form a solution. - The factors that affect the time taken to dissolve, including temperature and stirring. - Some liquids and solids can be separated using sieving, filtering and evaporation and to describe these processes.	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. - 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.
			Key Vocabulary
			control variable (LKS2), dissolve, filtering, insoluble, mixture, sieving, soluble, solution, stopwatch (LKS2), variable (LKS2)
Autumn Term 2 Materials: Properties and changes Exploring the properties of everyday materials and reversible and irreversible changes to them.	Planning - Writing a method including detail about how to ensure control variables are kept the same. Predicting - Making increasingly scientific predictions by: - using previous scientific knowledge and evidence to inform their predictions; - using scientific language to describe a potential outcome or explain why they think something will happen; making links between topics to evidence a prediction. Measuring (quantitative data) - Using standard units to measure and compare with increasing precision (decimals). Recording (tables) - Suggesting headings to tables, including units. Designing results tables with increasing independence with consideration of variables where applicable. Analysing and drawing conclusions - Writing a conclusion to summarise findings using increasingly complex scientific vocabulary. Evaluating - Identifying which variables were difficult to control and suggesting how to better control them. Commenting on the degree of trust by also reflecting on: - accuracy (human error with equipment); reliability (repeating results).	To describe a broader range of materials and their properties, including hardness, solubility, transparency, conductivity and response to magnets.	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. - Measure accurately in centimetres.
			Key Vocabulary
			Burning, conductor, control variable (LKS2), electrical conductivity, hazard, insulator, irreversible change, method (LKS2), reversible change, rust, rusting, safety, states of matter, thermal conductivity, transparency, trustworthy (LKS2), variable (LKS2)

Spring 1 Forces and space: Earth and space Exploring day and night and the movement of the Earth, planets and Moon.	Posing questions • Raising questions throughout the enquiry process. • Identifying testable questions. • Selecting the most appropriate enquiry method to answer questions and give justification. Recording • Drawing scientific diagrams by: • using a wider range of standard symbols; • drawing with increasing accuracy; • labelling with a broader range of scientific vocabulary; • annotating diagrams to explain concepts and convey opinions. • Suggesting headings to tables, including units. • Designing results tables with increasing independence with consideration of variables where applicable. Analysing and drawing conclusions • Using identified patterns to predict new values or trends.	To know • The Sun is a star at the centre of our Solar System. • The Sun, Earth and Moon are approximately spherical bodies. • The names, order and relative positions of the planets and other main celestial bodies. • A moon is a celestial body that orbits a planet and give examples of moons that orbit other planets. • The Earth and other planets orbit around the Sun. • The tilt of the Earth and its orbit around the Sun causes the seasons. • The Moon orbits around the Earth. • How the Earth’s rotation causes day and night and the apparent movement of the Sun across the sky. Science in action To know • Famous scientists throughout history. • How scientific knowledge has changed over time, leading to the current understanding of science. • Mistakes can lead to new discoveries. • About the work of modern-day scientists. About science in the news and recent discoveries. • The methods and equipment used by scientists throughout history and how these have led to modern methods. • Current scientific research and what it aims to achieve in the future. • Collaboration and peer reviewing are essential for effective scientific progress.	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. • 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.
			Key Vocabulary
			celestial bodies, data, day/daytime, degrees Celsius (LKS2), discovery, Earth evidence, gravity, Jupiter, line graph, line of best fit, Mars, Mercury, model moon, Neptune, night/night time, orbit, phase, planet, Pluto, Saturn, Solar System, spherical, star, temperature (LKS2), testable, Uranus, Venus, year

Spring 2 Animals, including humans: Circulation and health Exploring the heart and circulatory system through models and enquiries and considering how lifestyle choices affect our health.	Planning - Suggesting which variables will be changed, measured and controlled. Making and explaining decisions about what observations to make and how long to make them for. Writing a method, including details about how to ensure control variables are kept the same. Writing a method that considers reliability by planning repeated readings. Suggesting the most appropriate equipment to make observations and measurements and justifying their choices. Predicting - Making increasingly scientific predictions by using previous scientific knowledge and evidence to inform their predictions, using scientific language to describe a potential outcome or explain why they think something will happen and making links between topics to evidence a prediction. Observing - Using their senses to describe, in detail and with a broader range of scientific vocabulary, what they notice or what has changed. Measuring - Using standard units to measure and compare with increasing precision (decimals). Reading a wider variety of scales with unmarked intervals between numbers. Researching - Gathering answers to questions from a variety of sources. Recording (tables) - Using tables with columns that allow for repeat readings. Suggesting headings to tables, including units. Designing results tables with increasing independence with consideration of variables where applicable. Calculating the mean average. Graphing - Representing data by using line graphs and scatter graphs. Plotting points with greater accuracy. Reading the value of plotted points with greater accuracy. Analysing and drawing conclusions - Recognise the following across a broader range of contexts and in more complexity: naturally occurring patterns and relationships, changes over time and relevant secondary data. Writing a conclusion to summarise findings using increasingly complex scientific vocabulary. Suggesting with increasing independence how one variable may have affected another. Quoting relevant data as evidence of relationships. Identifying anomalies in repeat data and excluding results where appropriate. Comparing individual, class and/or model data to the prediction and recognising when they do not match. Using identified patterns to predict new values or trends. Evaluating - Commenting on the degree of trust by also reflecting on the reliability (repeating results) and sources of information (e.g. websites, books).	To know: - The main parts of the human circulatory system (heart, blood vessels and blood). - The heart pumps blood around the body. - Blood vessels transport blood around the body. - Blood transports vital substances around the body, including oxygen and nutrients. - The relationships between different organ systems. - The impact of diet, exercise, drugs and lifestyle on the way a body functions. - The heart rate is the number of beats per minute. Exercise increases heart rate. Science in action To know: - There are famous scientists throughout history. - There are a range of jobs and careers that use scientific knowledge and methods. - Science is in the news with recent discoveries. - There are spiritual, moral, social and cultural links with science. - There were methods and equipment used by scientists throughout history and these have led to modern methods. - Scientific knowledge has changed over time, leading to the current understanding of science. - Current scientific research is taking place with specific aims for the future.	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 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 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.
	Key Vocabulary		
	anomaly, blood, bloodstream, blood vessels, carbon dioxide, circulatory system, control variable (LKS2), data, drug, evaluate, evidence, fair test, heart, heart rate, line graph, mean average, model, oxygen, pulse, rate (LKS2), relationship, reliable, secondary source, trustworthy (LKS2), variable (LKS2)		

Summer 1 Energy: Light and reflection Exploring how light travels in straight lines and that this explains observations of shadows and reflection.	Posing questions - Identifying testable questions. Selecting the most appropriate enquiry method to answer questions and give justification. Planning - Suggesting which variables will be changed, measured and controlled. Writing a method including details about how to ensure control variables are kept the same. Observing - Using their senses to describe, in detail and with a broader range of scientific vocabulary, what they notice or what has changed. Measuring - Using standard units to measure and compare with increasing precision (decimals). Reading a wider variety of scales with unmarked intervals between numbers. Recording - Drawing scientific diagrams with increasing accuracy, labelling with a broader range of scientific vocabulary and annotating diagrams to explain concepts and convey opinions. - Using tables with columns that allow for repeat readings. - Calculating the mean average. Graphing - Representing data by using line graphs and scatter graphs. - Plotting points with greater accuracy. - Reading the value of plotted points with greater accuracy. Analysing and drawing conclusions - Writing a conclusion to summarise findings using increasingly complex scientific vocabulary. - Suggesting with increasing independence how one variable may have affected another. - Identifying anomalies in repeat data and excluding results where appropriate. - Using identified patterns to predict new values or trends. Evaluating - Identifying steps in the method that need changing and suggesting improvements. - Identifying which variables were difficult to control and suggesting how to control them better. - Commenting on the degree of trust by reflecting on accuracy (human error with equipment) and reliability (repeating results).	To know: - Light travels in a straight line from a light source. - Luminous objects are seen as a result of light directly entering the eye, whereas non-luminous objects reflect light into the eye. - Shiny surfaces reflect light uniformly. - When light is reflected off a surface, its direction changes. - Mirrors and periscopes work using reflection of light on smooth surfaces. - Shadows have the same shape as the objects that cast them as a result of light travelling in straight lines. - There are relationships between light sources, objects and shadows. - The distance between the object and the screen affects the size of the shadow. - The angle of a reflected ray is affected by the angle of the incoming ray on a smooth surface. Science in action To know: - There are famous scientists throughout history. - There are a range of jobs and careers that use scientific knowledge and methods. - Work is done by modern-day scientists. - There are methods and equipment used by scientists throughout history and these have led to modern methods. - Scientific knowledge has changed over time, leading to the current understanding of Science. - Collaboration and peer-reviewing are essential for effective scientific progress.	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. - Use ray diagrams to explain why shadows change size and why the shape of a shadow matches the object that was cast. - 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, describe how a mirror reflects light in different situations and 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. - 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.
	Key Vocabulary		
	anomaly, conclusion (LKS2), control variable (LKS2), evaluate, evidence, fair test, light ray, line graph, line of best fit, mean average, pupil, ray diagram, reflective, relationship, reliable, scale, testable, units, variable (LKS2)		

Summer 2 Exploring the properties and uses of space blankets, focusing on their reflective qualities, heat retention, and material composition.	This unit revisits the working scientifically skills covered including: Posing questions. Planning. Predicting. Observing. Measuring. Recording. Graphing. Analysing and drawing conclusions. Evaluating.	Mixtures and separation To know: • A broader range of materials and their properties, including hardness, solubility, transparency, conductivity and response to magnets. Properties and changes To know: • Dissolving, mixing and changes of state are reversible changes. • Some changes result in the formation of new materials and this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda. Earth and space To know: • The movement of the Earth and other planets relative to the Sun in the Solar System. • The Sun, Earth and Moon as approximately spherical bodies. Circulation and health To know: • The main parts of the human circulatory system (heart, blood vessels and blood). • The heart pumps blood around the body. Blood vessels transport blood around the body. • Blood transports vital substances around the body, including oxygen and nutrients. • The impact of diet, exercise, drugs and lifestyle on the way a body functions. • Exercise increases heart rate. Light and reflection To know: • Light travels in a straight line from a light source. • Shiny surfaces reflect light uniformly. • When light is reflected off a surface, its direction changes.	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.
			Key Vocabulary
			Blood, blood vessels, celestial bodies, circulatory system, conclusion (LKS2), degrees Celsius (LKS2), electrical conductivity, evaluate, evaporating (LKS2), evidence, fair test, filtering, hardness (LKS2), health (KS1), heart, heart rate, insulator (LKS2), irreversible, mixture, muscle (LKS2), predict (KS1), reflective (LKS2), reliable, reversible, sieving, spherical, temperature (LKS2), thermometer (LKS2), transparency, trustworthy (LKS2), variable (LKS2)