SUBJECT LEADER OVERVIEW

Science

SUBJECT LEADER

Debbie Legg

SUBJECT LINK GOVERNOR

Emma Coleman

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WHAT THE NATIONAL CURRICULUM SAYS ABOUT SCIENCE

A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

The national curriculum for science aims to ensure that all pupils:

* develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
*develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
*are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

Scientific knowledge and conceptual understanding The programmes of study describe a sequence of knowledge and concepts. While it is important that pupils make progress, it is also vitally important that they develop secure understanding of each key block of knowledge and concepts in order to progress to the next stage. Insecure, superficial understanding will not allow genuine progression: pupils may struggle at key points of transition (such as between primary and secondary school), build up serious misconceptions, and/or have significant difficulties in understanding higher-order content. Pupils should be able to describe associated processes and key characteristics in common language, but they should also be familiar with, and use, technical terminology accurately and precisely. They should build up an extended specialist vocabulary. They should also apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data. The social and economic implications of science are important but, generally, they are taught most appropriately within the wider school curriculum: teachers will wish to use different contexts to maximise their pupils' engagement with and motivation to study science.

The nature, processes and methods of science 'Working scientifically' specifies the understanding of the nature, processes and methods of science for each year group. It should not be taught as a separate strand. The notes and guidance give examples of how 'working scientifically' might be embedded within the content of biology, chemistry and physics, focusing on the key features of scientific enquiry, so that pupils learn to use a variety of approaches to answer relevant scientific questions. These types of scientific enquiry should include: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. Pupils should seek answers to questions through collecting, analysing and presenting data. 'Working

scientifically' will be developed further at key stages 3 and 4, once pupils have built up sufficient understanding of science to engage meaningfully in more sophisticated discussion of experimental design and control.

Spoken language The national curriculum for science reflects the importance of spoken language in pupils' development across the whole curriculum – cognitively, socially and linguistically. The quality and variety of language that pupils hear and speak are key factors in developing their scientific vocabulary and articulating scientific concepts clearly and precisely. They must be assisted in making their thinking clear, both to themselves and others, and teachers should ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions

School curriculum The programmes of study for science are set out year-by-year for key stages 1 and 2. Schools are, however, only required to teach the relevant programme of study by the end of the key stage. Within each key stage, schools therefore have the flexibility to introduce content earlier or later than set out in the programme of study. In addition, schools can introduce key stage content during an earlier key stage if appropriate. All schools are also required to set out their school curriculum for science on a year-by-year basis and make this information available online.

SCIENCE AT ALL SAINTS

INTENT

At All Saints we believe that a high quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

Science in our school is about developing children's ideas and ways of working that enable them to make sense of the world in which they live through investigation, as well as using and applying process skills. By Nurturing Hearts and Inspiring Minds, the staff at All Saints ensure that all children are exposed to high quality teaching and learning experiences, which includes allowing children to explore their outdoor environment and locality, thus developing their scientific enquiry and investigative skills.

IMPLEMENTATION

In order to meet the aims of the National curriculum for Science and in response to the Ofsted Research review into Science, we have identified the following key strands:

- Scientific knowledge and understanding of:
  - Biology - living organisms and vital processes.
  - Chemistry - matter and its properties.
  - Physics - how the world we live in 'works'.
- Working scientifically - processes and methods of science to answer questions about the world around us.
- Science in action - uses and implications of science in the past, present and for the future.

Our All Saints Primary Science scheme is a spiral curriculum, with essential knowledge and skills revisited with increasing complexity, allowing pupils to revise and build on their previous learning. A range of engaging recall activities promote frequent pupil reflection on prior learning, ensuring new learning is approached with confidence. The Science in action strand is interwoven throughout the scheme to make the concepts and skills relevant to pupils and inspiring for future application. Cross-curricular links are included throughout each unit, allowing children to make connections and apply their Science skills to other areas of learning.

Each unit is based upon one of the key science disciplines; Biology, Chemistry and Physics and to show progression throughout the school we have grouped the National curriculum content into six key areas of science:

Plants
Animals, Including Humans
Living Things and Their Habitats
Materials
Energy
Forces, Earth and Space

Pupils explore knowledge and conceptual understanding through engaging activities and an introduction to relevant specialist vocabulary. As suggested in Ofsted's Science research review (April 2021), the 'working scientifically' skills are integrated with conceptual understanding rather than taught discretely. This provides frequent, but relevant, opportunities for developing scientific enquiry skills. The scheme utilises practical activities that aid in the progression of individual skills and also provides opportunities for full investigations.

The 'Making connections' units delve beyond the essential curriculum, assimilating prior knowledge and skills to evoke excitement and to provide an additional method of assessing scientific attainment.

Lessons incorporate various teaching strategies from independent tasks to paired and group work, including practical, creative, computer-based and collaborative tasks. This variety means that lessons are engaging and appeal to those with different learning styles. In Year 1, we have tried to ease the transition into Key stage 1, by providing a selection of activities: some adult-led, some independent tasks, and some tasks that can be used during continuous provision depending on the class that our Year 1 pupils are assigned to.

IMPACT

The impact of All Saints' Science scheme can be constantly monitored through both formative and summative assessment opportunities. Each lesson includes guidance to support teachers in assessing pupils against the learning objectives and any relevant scientific enquiry skills. Furthermore, each unit has a unit quiz and a knowledge and skills catcher, which can be used at the beginning and/or end of the unit to provide a summative assessment. Opportunities for children to communicate using scientific vocabulary will also form part of the assessment process in each unit.

Pupils should leave school equipped with the requisite skills and knowledge to succeed in key stage 3 Science. They will have the necessary tools to confidently and meaningfully question and explore the world around them as well as critically and analytically experiencing and observing phenomena. Pupils will understand the significance and impact of Science on society.

The expected impact of following the Science scheme of work is that children will:

● Develop a body of foundational knowledge for the Biology topics in the National curriculum: Plants; Animals, Including Humans; Living Things and Their Habitats; Evolution and Inheritance.

● Develop a body of foundational knowledge for the Chemistry topics in the National curriculum: Everyday Materials; Uses of Everyday Materials; Properties and Changes of Materials; States of Matter; Rocks.

● Develop a body of foundational knowledge for the Physics topics in the National curriculum: Seasonal Changes; Forces and Magnets; Sound; Light; Electricity; Earth and Space.

● Be able to evaluate and identify the methods that 'real world' scientists use to develop and answer scientific questions.

● Identify and use equipment effectively to accurately gather, measure and record data.

● Be able to display and convey data in a variety of ways, including graphs.

● Analyse data in order to identify, classify, group, and find patterns.

● Use evidence to formulate explanations and conclusions.

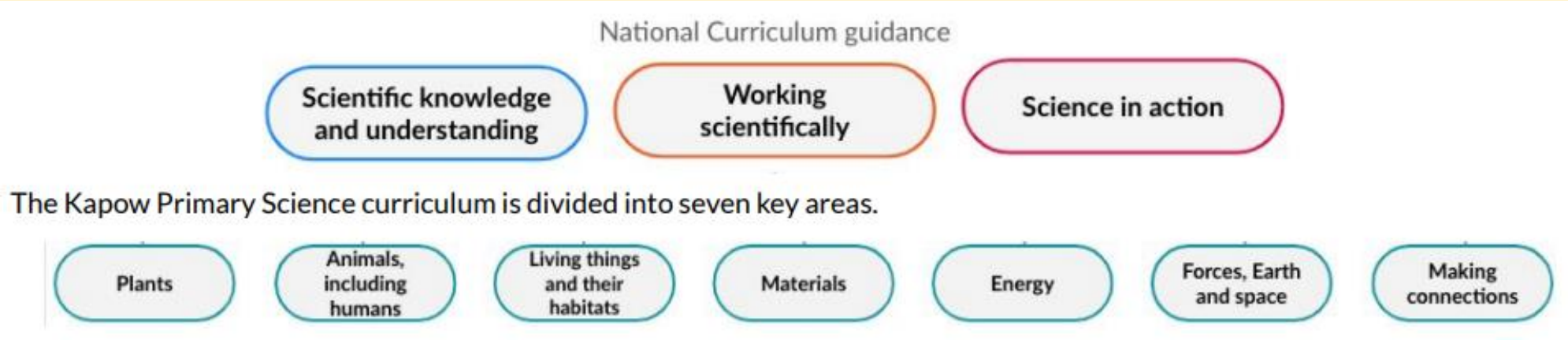
● Demonstrate scientific literacy through presenting concepts and communicating ideas using scientific vocabulary.

● Understand the importance of resilience and a growth mindset, particularly in reference to scientific enquiry.

● Meet the end of key stage expectations outlined in the National curriculum for Science.

Pupils are assessed against national curriculum objectives every half term. This is monitored by the subject leader, the senior leadership and the School Development Group.

STRANDS



CULTURAL CAPITAL

Cultural Capital is the essential knowledge that pupils need to be educated citizens, introducing them to the best that has been thought and said and helping to engender an appreciation of human creativity and achievement.

We want our pupils' 'lights to shine' both today in their future by not only giving them the knowledge and skills they need but by also installing a set of values and beliefs which enable them to be happy and successful citizens whilst having a positive impact on the lives of others.

SPIRITUAL, MORAL, SOCIAL AND CULTURAL (SMSC – DEVELOPED IN ALL LESSONS)

Spiritual: Explore beliefs and experience; respect faiths, feelings and values; enjoy learning about oneself, others and the surrounding world; use imagination and creativity; reflect. **Emphasise our school's close links to our local churches and our wider community.**

Moral: Recognise right and wrong; respect the law; understand consequences; investigate moral and ethical issues; offer reasoned views.

Social: Use a range of social skills; participate in the local community; appreciate diverse viewpoints; participate, volunteer and cooperate; resolve conflict; engage with the **'British values'** of democracy, the rule of law, liberty, respect and tolerance.

Cultural: Appreciate cultural influences; appreciate the role of Britain's parliamentary system; participate in culture opportunities; understand, accept, respect and celebrate diversity.

BRITISH VALUES (TO BE DEVELOPED IN ALL LESSONS)

The core British Values are:

- Democracy
- Rule of Law
- Mutual Respect
- Individual Liberty
- Tolerance

Our science curriculum casts a light on global citizenship and the rule of law, including the role of democratic advocacy for change. Pupils also look at how different cultures live and work throughout the world.

SCIENCE CURRICULUM

DESIGN OF CURRICULUM

Our foundation subjects use Kapow planning. This carefully tracks the progression of skills and knowledge throughout the school.

Due to our dual year groups, we look at coverage over 2 years rather than one.

Subject leaders have not taken for granted that Kapow covers all aspects / objectives required of the subject and have cross referenced the schemes with or tracking of skills and knowledge and then with the National Curriculum objectives.

The curriculum enables pupils to be supported, when necessary, but at the same time challenges pupils with deep questioning.

Our ambitious curriculum is designed taking into account the following:

- The curriculum is for all pupils regardless of their starting points
- The curriculum values **Science**
- Big ideas / big questions are used to provoke deeper learning
- The curriculum teaches knowledge and skills
- The curriculum is well sequenced
- Expectations are high
- Where teachers are not confident about their knowledge for a specific lesson / scheme, they consult with colleagues, the subject leader or use the Kapow teacher videos before each lesson.
- Resources are available and of a high quality
- Subject leaders know their subject
- Vocabulary is rich and diverse

DELIVERY OF CURRICULUM

Science is a core subject and lessons of at least 50 minutes are delivered weekly for all year groups, usually in the afternoons. If additional time is required to fit in the whole scheme of work, this will happen.

WHY BASE OUR CURRICULUM ON KAPOW SCHEMES OF WORK

We involved all our teaching staff in choosing schemes of work which would be suited to our school.

Subject Leaders spent half a term looking at different options for their subject and all were extremely positive about KAPOW, the progression and the resources available.

There is no requirement on staff to use the KAPOW resources. They are to follow the 'Big Question' and the objectives for each lesson, however, how they get there is up to them. This means we have flexibility but, at the same time, ready made quality resources and activities to use if they require.

Kapow is releasing mixed year group planning from September 2024, and we have adapted our curriculum to follow this new overview , whilst also ensuring that there are no gaps in pupils' during the changeover.

TRACKING PROGRESSION OF SKILLS AND KNOWLEDGE

The overview of skills and knowledge covered in each phase and strand and how these skills are developed in order to enable pupils to reach the end of key stage outcomes - outlined in the National curriculum - are listed in our **Science** Progression Document.

Within each key stage, knowledge is often introduced at the start of the key stage so that there is time for that knowledge to be revisited and applied in later years which is why knowledge accumulation may look heavier in some year groups than others. As we have joint classes, progression statements in Key stage 2 are shown for lower key stage 2 and upper key stage 2 only and not for individual year groups. Key concepts and knowledge are revisited in different contexts to ensure that pupils have a secure understanding by the end of each phase.

END OF KEY STAGE EXPECTED KNOWLEDGE AND SKILLS			
AREA	**EYFS**	**KS1**	**KS2**
Subject Knowledge: **Plants**	**Development Matters** Describe what they see, hear and feel whilst outside Explore the natural world around them. Recognise some environments that are different to the one in which they live. Understand the effect of changing seasons on the natural world around them. **Early Learning Goals** Explore the natural world around them, making observations and drawing pictures of animals and plants. • Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. **Characteristics of Effective Learning:**	To know a variety of common plants, and how they differ. To know that deciduous trees lose their leaves seasonally, but evergreen trees do not. To know the basic structure (including leaves, flowers (blossom), fruit, roots, bulb, seed, trunk, branches, stem) of a variety of common plants, including flowering plants and trees. To begin to understand how plants grow and change over time. To know that seeds and bulbs grow into seedlings by producing roots and shoots. To know that seedlings grow into mature plants by developing parts such as roots, stems, leaves and flowers. To know that seeds need water and warmth to germinate. To know that plants need water, light and a suitable temperature for growth and health.	**LKS2** To understand the functions of the basic parts of a plant and the relationship between structure and function. To know that water is transported within a plant from the root, through the stem, to the leaves. To know that plants need water, light, air, nutrients and a suitable temperature for growth and health. To understand that the needs for growth and health vary from plant to plant. To know the life cycle of a plant from seed to mature plant. To know that flowers are the reproductive organ of a plant. To know that the process of pollination is the transfer of pollen to the female (part of the) flower. To know that the process of seed formation is the growth of a seed after pollination.. To know some different methods of seed dispersal and the benefits of each. **UKS2** N/A

	(Not ALL are expected, but opportunities are provided to suit different learning styles with regards to Understanding the World and Science) • Bring their own interests and fascinations into early years settings Respond to new experiences that you bring to their attention.		
Subject Knowledge: **Animals Including Humans**	**Development matters** Describe what they see, hear and feel whilst outside Explore the natural world around them. Recognise some environments that are different to the one in which they live. Understand the effect of changing seasons on the natural world around them. **Early Learning Goals** Explore the natural world around them, making observations and drawing pictures of animals and plants. • Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. • Understand some important processes and	To know a variety of common animals (including fish, amphibians, reptiles, birds and mammals). To understand how living things change, and that animals have offspring that grow into adults. To know which offspring comes from which parent animal. To know the stages in some animal life cycles. To know the main body parts of common animals (arms, legs, wings, tails, fins, head, trunk, horns/tusks, shell) To know key parts of the human body (including head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth). To know the five main senses: sight, smell, hearing, taste and touch. To know that the skin is used for touch, the tongue is used for taste, the nose is used for	**LKS2** To know that animals can be grouped based on the presence of a skeleton. To know that the skeleton in humans and some animals is used for movement, protection and support. To know that the muscular system in humans and some animals works with the skeleton for movement. To know the main bones in the body. To know the main organs of the human digestive system (mouth, teeth, tongue, oesophagus, stomach, small and large intestines) and describe their simple functions. To know the different types of human teeth (incisor, canine, premolar and molar) and their simple functions. To know that animals, including humans, need the right types and amount of nutrition. To understand that humans cannot make their own food and therefore eat to get the nutrition needed. To know the main food groups (carbohydrates, protein, fats, fibre, vitamins, minerals and water) and their simple functions. To know that a balanced diet should include all food groups. To describe the diets of different animals

	changes in the natural world around them, including the seasons and changing states of matter. **Characteristics of Effective Learning:** *(Not ALL are expected, but opportunities are provided to suit different learning styles with regards to Understanding the World and Science)* • Bring their own interests and fascinations into early years settings Respond to new experiences that you bring to their attention. Use pretend play to think beyond the 'here and now' and to understand another perspective.	smell, the eyes are used for sight and the ears are used for hearing. To know that a carnivore is an animal that eats other animals and give some examples. To know that a herbivore is an animal that eats only plants and give some examples. To know that an omnivore is an animal that eats both animals and plants, and to give some examples. To know that animals, including humans, need water, food and air to survive. To understand the importance of exercise, a balanced diet and hygiene for humans.	To know that teeth can be damaged, including the effect of sugary and acidic food. To know that it is important to brush teeth twice a day, make good food choices and visit the dentist regularly. To describe the teeth of carnivores and herbivores, and understand why they are different. To know that predators hunt for their food and prey are the animals being hunted. To know that producers make their own food. To know that food chains begin with a producer followed by consumers, and arrows to show the energy passed on. **UKS2** To describe the human life cycle, including the stages of growth and development (baby, toddler, child, teenager, adult, elderly). To describe changes that occur during puberty (in boys and girls). To know that gestation periods vary across mammals. To know the main parts of the human circulatory system (heart, blood vessels and blood). To know that the heart pumps blood around the body. To know that the blood vessels transport blood around the body. To know that the blood transports vital substances around the body, including oxygen and nutrients. To understand the relationships between different organ systems. To understand the impact of diet, exercise, drugs and lifestyle on the way a body functions. To know that the heart rate is the number of beats per minute. To know that exercise increases heart rate.

Subject Knowledge: **Living Things and Their Habitats**	**Development matters** Describe what they see, hear and feel whilst outside Explore the natural world around them. Recognise some environments that are different to the one in which they live. **Early Learning Goals** Explore the natural world around them, making observations and drawing pictures of animals and plants. • Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class **Characteristics of Effective Learning:** *(Not ALL are expected, but opportunities are provided to suit different learning styles with regards to Understanding the World and Science)* • Bring their own interests and fascinations into early years settings Respond to new experiences that you bring to their attention.	To begin to understand some of the life processes, including movement, reproduction, sensitivity, growth, excretion and nutrition. To know the difference between things that are living, dead, and things that have never been alive, using some of the life processes. To know a variety of plants and animals and describe some differences. To name a variety of habitats, including woodland, ocean, rainforest and seashore. To know that a habitat is the environment where an animal or plant lives/ grows, because it provides what they need to survive. To know that a micro-habitat is a very small habitat (e.g. stones, logs and leaf litter). To know that living things depend upon each other (e.g. for food, shelter.) To understand that a food chain can be used to show how animals obtain food from eating either plants and/or other animals.	**LKS2** To know that living things can be grouped in different ways. To know that a classification key can be used to group and identify plants and animals. To know that vertebrates are animals which have a backbone and invertebrates are animals which do not have a backbone. To know that plants can be grouped into flowering or non-flowering varieties. To know that flowering plants include grasses and non-flowering plants includes ferns and mosses. To know that there are five main vertebrate groups: birds, mammals, reptiles, amphibians and fish. To know that invertebrate groups include snails, slugs, worms, spiders and insects To know that habitats can change throughout the year and this can be dangerous for living things. To know that humans can have both a positive and negative impact on the environment. **UKS2** To know that a life cycle shows the changes an animal or plant goes through until the reproduction of a new generation when the cycle starts again. To know that all living things must reproduce for the species to survive. To know that sexual reproduction requires two parents, whereas asexual reproduction only requires one parent. To know that there are different processes plants and animals use to reproduce (asexual and sexual reproduction). To know that 'organism' is a term used to refer to an individual living thing. To know that micro-organisms are incredibly small and cannot usually be seen by the naked eye.

			To know the characteristics of the different groups of vertebrates and commonly found invertebrates. To know that living things have changed over time. To know that fossils provide us with information about living things that inhabited the Earth millions of years ago. To know that characteristics are passed from parents to their offspring, but that all offspring vary from their parents. To know that over time, variation in offspring can affect animals' chances of survival in particular environments. To know that animals and plants have adapted to suit their environment over many millions of years and that this process can be called evolution.
Subject Knowledge: **Materials**	**Development Matters** Describe what they see, hear and feel whilst outside Explore the natural world around them. Recognise some environments that are different to the one in which they live. **Early Learning Goals** Explore the natural world around them, making observations and drawing pictures of animals and plants. • Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. • Understand	To know that objects are items or things. To know that a material is what an object is made from. To identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock. To know that property refers to how a material can be described. To describe the physical properties of a variety of everyday materials. To understand that materials can be grouped based on their physical properties. To know why objects are made from particular materials and to give examples of their suitability. To know that one material can be	**LKS2** To know that rocks can be grouped based on their appearance or properties, (e.g. colour, texture, hardness, permeability.) To know that rocks may contain grains, crystals or fossils. To know that grains and crystals appear differently and can be used to classify rocks. To know that soils are made from rocks and dead matter. To know that all substances around us can exist as solids, liquids and gases. To understand the relationship between the properties of rocks and their uses. To know that a property of a solid is that it keeps its shape unless a force is applied to it. To know that a property of a liquid can flow freely and take on the shape of a container. To know that a property of a gas does not have a fixed shape and can escape from an unsealed container.

	some important processes and changes in the natural world around them, including the seasons and changing states of matter. **Characteristics of Effective Learning** *(Not ALL are expected, but opportunities are provided to suit different learning styles with regards to Understanding the World and Science)* • Bring their own interests and fascinations into early years settings Respond to new experiences that you bring to their attention. Use pretend play to think beyond the 'here and now' and to understand another perspective. Sort materials. For example, at tidy-up time, children know how to put different construction materials in separate baskets.	used for a range of purposes (and to give examples.) To know that different materials can be used for the same purpose (and to give examples.) To know why certain materials are unsuitable for particular objects. To know that a push or pull must be applied to change the shape of a solid object. To know that solid objects can be squashed, bent, twisted or stretched. To know that different solid objects may take a different amount of force to change shape.	To know that fossils can form from the remains of living things. To know that rocks can change over time (e.g. erosion, weathering). To know that heating causes solids to turn into liquids (melting) and liquids to turn into gases (evaporating). To know that cooling causes gases to turn into liquids (condensing) and liquids to turn into solids (freezing). To know that water can exist as a solid, a liquid or a gas. To know that the melting point of water is zero degrees Celsius and the boiling point of water is 100 degrees Celsius. To know that water flows around the world in a continuous process called the water cycle. To know that in the water cycle, evaporation is when bodies of water are heated and turn into water vapour. To know that in the water cycle, condensation is the process of water vapour cooling to form water droplets in clouds, which can result in precipitation. To know that the rate of evaporation increases as temperature rises. **UKS2** To describe a broader range of materials and their properties, including hardness, solubility, transparency, conductivity and response to magnets. To know that some substances will dissolve in a liquid to form a solution. To know the factors that affect the time taken to dissolve, including temperature and stirring. To understand that dissolving, mixing and changes of state are reversible changes. To know that some liquids and solids can be separated using sieving, filtering and evaporation and to describe these processes. To understand that some changes result in the formation of new materials and that these are usually irreversible. (e.g. burning, rusting, the action of acid on bicarbonate of soda.)

Subject Knowledge: **Energy**	**Development Matters** Describe what they see, hear and feel whilst outside Explore the natural world around them. Recognise some environments that are different to the one in which they live. **Early Learning Goals** Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. **Characteristics of Effective Learning** *(Not ALL are expected, but opportunities are provided to suit different learning styles with regards to Understanding the World and Science)* • Bring their own interests and fascinations into early years settings Respond to new experiences that you bring to their attention. Use pretend play to think beyond	N/A	**LKS2** To know that light travels from a source (e.g. the Sun, light bulbs and torches). To know that light is needed to see things and that dark is the absence of light. To know that light from the Sun can be dangerous and how to protect their eyes. To know that all materials reflect light. To know that shadows are formed when the light from a light source is blocked by an opaque object. To know that shadows change as a result of different factors: - Changing the position of the light source. - Changing the distances between the light source, object and surface. To know that shadows change position and length throughout the day as the Sun changes position in the sky. To understand that sound is a result of vibrations. To know that vibrations from sounds travel through mediums to the ear. To know that an insulating material reduces the amount of vibrations that pass through it and this can be used to protect the ears from damaging sounds. To know that different materials provide different amounts of insulation against sound. To know a variety of ways to change the pitch or volume of a sound. To know that quicker vibrations cause higher-pitched sounds and slower vibrations cause lower-pitched sounds. To know that stronger vibrations cause louder sounds and weaker vibrations cause quieter sounds. To know that sounds get fainter as the distance from the sound source increases. To know that all electrical appliances need a power source, including batteries or mains electricity. To know that an electrical circuit needs a complete path for the electrical

	the ‘here and now’ and to understand another perspective.		charge to flow through. To know the main components in a simple series circuit. To know the precautions for working safely with electricity. To know that some materials allow electrical charge to pass through them quickly and these are known as electrical conductors (e.g. metals). To know that some materials do not allow electrical charge to pass through them easily and these are known as electrical insulators (e.g wood and plastic). To know that metals are used for cables and wires because they are good conductors of electricity. To know that plastic is used to cover cables and wires because it is a good insulator. To understand that an open switch breaks a series circuit so the components will be off. To understand that a closed switch completes a series circuit so the components will be on. To understand the relationship between bulb brightness and the number of bulbs in a circuit. **UKS2** To know that light travels in a straight line from a light source. To understand that luminous objects are seen as a result of light directly entering the eye, whereas non-luminous objects reflect light into the eye. To know that shiny surfaces reflect light uniformly. To know that when light is reflected off a surface, its direction changes. To know that mirrors and periscopes work using reflection of light on smooth surfaces. To understand why shadows have the same shape as the objects that cast them as a result of light travelling in straight lines. To understand relationships between light sources, objects and shadows.

			To understand how and why the distance between the object and the screen affects the size of the shadow. To understand how the angle of a reflected ray is affected by the angle of the incoming ray on a smooth surface. To know a wider variety of components in a series circuit (including buzzer and motor). To know the conventions used to draw circuit diagrams, including the recognised symbols for common components and using straight lines. To know that the voltage of a circuit can be changed and how this affects bulb brightness (or buzzer volume).
Subject Knowledge: **Forces, Earth and Space**	**Development Matters** Describe what they see, hear and feel whilst outside Explore the natural world around them. Recognise some environments that are different to the one in which they live. Understand the effect of changing seasons on the natural world around them. **Early Learning Goals** Explore the natural world around them, making observations and drawing pictures of animals and plants. • Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. • Understand	To know the name and order of the four seasons; spring, summer, autumn and winter. To know that it is unsafe to look directly at the Sun. To know weather associated with the four seasons and how it changes (in the UK). To understand that day length varies across the four seasons, with fewer daylight hours in the winter and more in the summer.	**LKS2** To know some examples of contact and non-contact forces. To know that some forces are a result of contact between two surfaces, but some forces can act at a distance (e.g. magnetism). To know the North and South poles of a magnet. To know some examples of magnetic materials, including iron and nickel, and how they react to a magnet and each other. To know some different examples of magnets, including bar, horseshoe, button and ring, To know some uses of magnets. To know that friction is a contact force that acts between two surfaces to slow an object down. To know that magnetism is a non-contact force that affects objects containing magnetic metal. To understand that the opposite poles of a magnet attract one another and like poles repel one another. To know that rougher surfaces have more friction between them than smoother surfaces. To understand that the strength of different magnets may vary. **UKS2**

	some important processes and changes in the natural world around them, including the seasons and changing states of matter. **Characteristics of Effective Learning** *(Not ALL are expected, but opportunities are provided to suit different learning styles with regards to Understanding the World and Science)* • Bring their own interests and fascinations into early years settings Respond to new experiences that you bring to their attention. Use pretend play to think beyond the 'here and now' and to understand another perspective.		To know that the Sun is a star at the centre of our solar system. To know that the Sun, Earth and Moon are approximately spherical bodies. To know the names, order and relative positions of the planets and other main celestial bodies. To know that a moon is a celestial body that orbits a planet and give examples of moons that orbit other planets. To know that the Earth and other planets orbit around the Sun. To know that the tilt of the Earth and its orbit around the Sun causes the seasons. To know that the Moon orbits around the Earth. To understand how the Earth's rotation causes day and night and the apparent movement of the Sun across the sky. To know that gravity is a non-contact force that pulls objects together. To know that air resistance and water resistance are both types of friction. To know that unsupported objects fall towards the Earth because of gravity. To know that friction, air resistance and water resistance act in the opposite direction to a moving object. To know that when forces are imbalanced, the speed, shape or direction of an object changes. To know that when forces are balanced the speed, shape or direction of an object stays the same. To know that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect. To know that rougher surfaces have more friction between them than smoother surfaces and how that may affect movement. To know that the larger the surface area of an object the greater the air or water resistance it creates.

Working Scientifically	**Development Matters** Describe what they see, hear and feel whilst outside Explore the natural world around them. Recognise some environments that are different to the one in which they live. Understand the effect of changing seasons on the natural world around them. **Early Learning Goals** Explore the natural world around them, making observations and drawing pictures of animals and plants. • Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. **Characteristics of Effective Learning** *(Not ALL are expected, but opportunities are provided to suit different learning styles with regards to Understanding the World and Science)* Realise that their actions have an	Exploring the world around them and raising their own simple questions. Recognising there are different types of enquiry (ways to answer a question). Responding to suggestions on how to answer questions. Beginning to recognise whether a test is fair. With support, deciding if suggested observations are suitable. Ordering a simple method. Suggesting what might happen, often justifying with personal experience. Using their senses to describe, in simple terms, what they notice or what has changed. Using non-standard units to measure and compare. Beginning to use standard units to measure and compare. Beginning to use simple measuring equipment to make approximate measurements. Reading simple numbered scales. Gathering specific information from one simplified, specified source.	**LKS2** 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. Beginning to select from options which variables will be changed, measured and controlled. Suggesting what observations to make and how long to make them for. 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. Making predictions about what they think will happen by: ● Using scientific knowledge and/or personal experience to explain their prediction (because…) ● Beginning to consider cause and effect when making predictions, where appropriate. ● Predicting a trend by considering how the changing variable will affect the measured variable. (The smoother the surface, the longer the distance the car will travel) Using their senses to describe, in more detail and with simple scientific vocabulary, what they notice or what has changed. Using standard units to measure and compare. Using measuring equipment with increasing accuracy. Reading scales with unmarked intervals between numbers. Gathering specific information from a variety of sources.

	effect on the world, so they want to keep repeating them. Plan and think ahead about how they will explore or play with objects Make independent choices Bring their own interests and fascinations into early years settings Respond to new experiences that you bring to their attention. Begin to correct their mistakes themselves. Keep on trying when things are difficult. Take part in simple pretend play. Sort materials. Review their progress as they try to achieve a goal. Check how well they are doing. Solve real problems. Use pretend play to think beyond the 'here and now' and to understand another perspective Know more, so feel confident about coming up with their own ideas. Make more links between those ideas.	Drawing and labelling simple diagrams Using a prepared table to record results including: ● Numbers. ● Simple observations. ● Tally frequency. Grouping based on visible characteristics. Organising questions to create a simple classification key. Representing data using pictograms and block charts. Using their results to answer simple questions. Beginning to recognise when results or observations do not match their predictions. Beginning to recognise whether a test is fair or not.	Beginning to draw more scientific diagrams by: ● Using some standard symbols. ● Drawing in 2D to produce simple line diagrams. ● Labelling with more scientific vocabulary. 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 based on visible characteristics and measurable properties. Populating a pre-prepared branching and number key. Choosing appropriate questions for classification keys. Representing data using bar charts. Drawing bars with greater accuracy. Reading the value of bars with greater accuracy. Writing a conclusion to summarise findings using simple scientific vocabulary. Beginning to suggest how one variable may have affected another. Beginning to quote results as evidence of relationships. Identifying data that does not fit a pattern (anomalous data). Recognising when results or observations do not match their predictions. Beginning to use identified patterns to predict new values or trends. 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: ● Results that do not fit a pattern (anomalies). ● The quality of results (accurate measurements and maintaining control variables). Beginning to identify new questions that would further the enquiry. **UKS2**

			Raising questions throughout the enquiry process. Identifying testable questions. Selecting the most appropriate enquiry method to answer questions and give justification. 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 detail 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. 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. Using their senses to describe, in detail and with a broader range of scientific vocabulary, what they notice or what has changed. Using standard units to measure and compare with increasing precision (decimals). Reading a wider variety of scales with unmarked intervals between numbers. Gathering answers to open-ended questions from a variety of sources. 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.

			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. Grouping in a broader range of contexts. Organising the layout of number and branching keys. Formulating appropriate questions for classification keys. Representing data by using line graphs and scatter graphs. Plotting points with greater accuracy. Reading the value of plotted points with greater accuracy 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. 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 also reflecting on: ● Accuracy (human error with equipment). ● Reliability (repeating results). ● Sources of information (e.g. websites, books). Posing new questions in response to the data that would extend the enquiry. Deciding what data to collect to further test direct relationships.

Science In Action	**Development Matters** Describe what they see, hear and feel whilst outside Explore the natural world around them. Recognise some environments that are different to the one in which they live. Understand the effect of changing seasons on the natural world around them. **Early Learning Goals** Explore the natural world around them, making observations and drawing pictures of animals and plants. • Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. **Characteristics of Effective Learning** *(Not ALL are expected, but opportunities are provided to suit different learning styles with regards to Understanding the World and Science)* Realise that their actions have an	To know about famous scientists throughout history. To know about a range of jobs and careers that use scientific knowledge and methods. To know about the work of modern-day scientists. To know about science in the news and recent discoveries. To know there are spiritual, moral, social and cultural links with Science.	**LKS2** To know about the methods and equipment used by scientists throughout history and how these have led to modern methods. To know how scientific knowledge has changed over time, leading to the current understanding of Science. To know about current scientific research and what it aims to achieve in the future. To know that mistakes can lead to new discoveries. To know that collaboration and peer reviewing is essential for effective scientific progress. **UKS2** To know how scientific evidence is used to support or refute ideas or arguments.

	effect on the world, so they want to keep repeating them. Plan and think ahead about how they will explore or play with objects Make independent choices Bring their own interests and fascinations into early years settings Respond to new experiences that you bring to their attention. Begin to correct their mistakes themselves. Keep on trying when things are difficult. Take part in simple pretend play. Sort materials. Review their progress as they try to achieve a goal. Check how well they are doing. Solve real problems. Use pretend play to think beyond the 'here and now' and to understand another perspective Know more, so feel confident about coming up with their own ideas. Make more links between those ideas.		

ENRICHMENT

When possible, and after taking into consideration expense, time constraints and impact on learning, enrichment activities such as trips, outdoor work and visitors are encouraged in Science. We also work hard to ensure that our outdoor spaces enrich the science learning of pupils at All Saints, through forest school, gardening and the pond area. After school clubs/lunchtime clubs that are available throughout the year include gardening, STEAM and forest school activities.

LOCAL AWARENESS

In all aspects of the curriculum we take every opportunity to help pupils to connect with their immediate surroundings and develop a global perspective by making connections between their everyday lives and the world around them.

CROSS CURRICULAR LINKS

Links to other learning will be made wherever possible, providing they help the pupils with their understanding and are in no way tenuous. Guided reading texts are regularly selected to further underpin learning.

HOW WE ASSESS

Class teachers assess each pupil against each objective in every subject 5 times each year (at the end of Autumn Term 2, Spring Term 1, Spring Term 2, Summer Term 1 and Summer Term 2).

Assessment is putting a pupil at ARE, WT or Below (and in some cases GD) against each objective.

This has been agreed by all teachers and is not seen as too onerous or time consuming. This has been fully supported by the Staff Welfare Representative and the Welfare Governor who have both liaised with teachers.

HOW WE MODERATE

Subject leaders are given at least half a day per term to monitor and moderate their subject.

Moderation takes the form of:

- Drop in
- Book Scrutiny
- Pupil Voice
- Data analysis
- Link Governor visits
- Observation
- Teacher Chat

Every Staff Meeting also has an agenda item where Subject Leaders can pass on any issues / points / questions / requests / advice to teachers.

Subject leaders can also request moderation time in staff meetings.

Class Teachers assess every pupil against each objective in every subject at the end of every term.

Headteacher / Deputy Head and Subject Governor monitors subjects each year

SUBJECT LEADER CPD

Subject Leaders have taken part in curriculum sharing with other local schools.

In additions, Subject Leaders are to complete at least one subject specific CPD course with National College every year.

RESOURCES

With Kapow being new to the school, Class Teacher are asked to speak to Subject Leaders about any additional resources which may be required (any that may have been missed when Subject Leaders were balancing the curriculum).

Each weekly Staff Meeting has an agenda item where Class Teacher and Subject Leaders have an additional opportunity to request and additional resources,

RECORDING OF LEARNING

KS1 pupils use a class floor book as a record of class learning in science.

KS2 pupils have a folder or book in which they keep a record of their KS2 learning journey in science.

Knowledge Organisers are included at the start of each unit.

RECENT FEEDBACK GIVEN TO STAFF

SUBJECT ACTION PLAN 2024/25

- To shift to teaching the new mixed year group science units for 2024/25, using Kapow resources as needed.
- Ensure that Years 2 and 4 and 6 do not miss any curriculum knowledge objectives due to these changes to the two year cycle (see annotations to units overview for 2024/25 only)

EYFS

Understanding the World (Science) Curriculum, Characteristics of Effective Learning

2024-2025: No Kapow Units Available.

The tailor-planned units below will address any EYFS UW objectives not already covered by Geography, History, PSHE and RE Kapow planning.

EYFS planning overview to be updated once Kapow release units, expected Sept 2026.

	Reception Science 2024-25
Autumn 1	Seasons: Autumn
Autumn 2	Investigating Changes: Hot and Cold Seasons: Winter
Spring 1	Seasons: Winter All About Animals
Spring 2	Seasons: Spring
Summer 1	(Outdoor Adventures – Geography Unit)
Summer 2	Seasons: Summer Wow Investigations

Science Linked Learning for EYFS

Understanding The World, 3-4 Years

- Use all their senses in hands-on exploration of natural materials.
- Explore collections of materials with similar and/or different properties.
- Talk about what they see, using a wide vocabulary.
- Plant seeds and care for growing plants.
- Understand the key features of the life cycle of a plant and an animal.
- Begin to understand the need to respect and care for the natural environment and all living things.
- Explore and talk about different forces they can feel.
- Talk about the differences between materials and changes they notice.

Understanding The World, In Reception

- Explore the natural world around them.
- Describe what they see, hear and feel whilst outside.
- Recognise some environments that are different from the one in which they live.
- Understand the effect of changing seasons on the natural world around them.

Understanding The World, Early Learning Goals

☐ Explore the natural world around them, making observations and drawing pictures of animals and plants

☐ Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class

☐ Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

Characteristics of Effective Learning, Playing and Exploring

☐ Showing curiosity about objects, events and people

☐ Using senses to explore the world around them

☐ Engaging in open-ended activity

☐ Showing particular interests

Characteristics of Effective Learning, Creating and Thinking Critically, Having Their Own Ideas

- ☐ Thinking of ideas
- ☐ Finding ways to solve problems
- ☐ Finding new ways to do things

Characteristics of Effective Learning, Creating and Thinking Critically, Making Links

- ☐ Making links and noticing patterns in their experience
- ☐ Making predictions
- ☐ Testing their ideas
- ☐ Developing ideas of grouping, sequences, cause and effect

Characteristics of Effective Learning, Creating and Thinking Critically, Choosing Ways to Do Things

- ☐ Planning, making decisions about how to approach a task, solve a problem and reach a goal
- ☐ Checking how well their activities are going
- ☐ Changing strategy as needed
- ☐ Reviewing how well the approach worked

RECEPTION			
Autumn 1 **Seasons: Autumn (Not Kapow)**			
Development Matters			
Early Learning Goals			
Key Vocabulary	Autumn leaves		
Key Skills			
Key Knowledge			
Curriculum Opportunities	Link to Phonics Learning Link to Fine Motor Learning (point and click, art) Link to Maths, number recognition Link to any topic learning with point and click websites Link to PSED being safe on digital devices and reasons for rules		

KS1 (Year 1 and 2)

https://www.kapowprimary.com/subjects/science/mixed-age-year-1-2/

Kapow Mixed Year Group Units KS1 (released 2.9.24)	**Cycle Year A**	**Cycle Year B 2024-2025**
Autumn 1	Plants: Introduction to Plants	Animals: Sensitive Bodies
Autumn 2	Forces & Space: Seasonal Changes	Materials: Everyday Materials
Spring 1	Living Things and Their Habitats: Habitats	Animals Including Humans: Comparing Animals
Spring 2	Animals Including Humans: Lifecycles and Health	Materials: Uses of Everyday Materials
Summer 1	Plants: Plant Growth	Living Things and Their Habitats: Microhabitats
Summer 2	Making Connections A	Making Connections B
		***Summer 2, 2025 only**: Ensure at least the Y2 pupils cover a couple of lessons on life cycles, health & plant growth (due to following Y1 only curriculum the previous year)

Ruby Class Y3/4

https://www.kapowprimary.com/subjects/science/science-mixed-age-year-3-4/

Kapow Mixed Year Group Units LKS2 **(released 2.9.24)**	**Cycle Year A**	**Cycle Year B 2024-2025**
Autumn 1	Energy: Light and Shadows (mixed 3/4)	Forces, Earth and Space: Forces and Magnets (mixed 3/4)
Autumn 2	Animals Including Humans: Movement and Nutrition (mixed 3/4)	Materials: States of Matter (mixed 3/4) ***Note for 2024 only**
Spring 1	Materials: Rocks and Soil A (mixed 3/4)	Materials: Rocks and Soil B (mixed 3/4)
Spring 2	Animals Including Humans: Digestion and Food (mixed 3/4)	Energy: Sound and Vibrations (mixed 3/4)
Summer 1	Energy: Electricity and Circuits (mixed 3/4)	Living Things and Their Habitats: Classification and Changing Habitats (mixed 3/4)
Summer 2	Making Connections A (mixed 3/4)	Making Connections B (mixed 3/4)
		***Autumn 2, 2024 only,** also ensure that at least the Y4 pupils cover some elements of Animals Including Humans: Movement and Nutrition from Cycle A this half term)

Sapphire Class Y5/6

https://www.kapowprimary.com/subjects/science/science-mixed-age-year-5-6/

Kapow Mixed Year Group Units UKS2 **(released 2.9.24)**	**Cycle Year A**	**Cycle Year B 2024-2025**
Autumn 1	Living Things: Life Cycles and Reproduction (mixed 5/6)	Materials: Mixtures and Separation (mixed 5/6)
Autumn 2	Forces, Earth and Space: Unbalanced Forces (mixed 5/6)	Materials: Properties and Changes (mixed 5/6)
Spring 1	Living Things and Their Habitats: Classifying Big and Small (mixed 5/6)	Forces, Earth and Space: Earth and Space (mixed 5/6)
Spring 2	Energy: Circuits, Batteries and Switches (mixed 5/6)	Animals Including Humans: Circulation and Health (mixed 5/6)
Summer 1	Living Things and Their Habitats: Evolution and Inheritance (mixed 5/6)	Energy: Light and Reflection (mixed 5/6)
Summer 2	Animals Including Humans: Human Timeline (mixed 5/6) Optional Unit: Making Connections B	Making Connections A (mixed 5/6)

EYFS – Key Vocabulary, Key Skills and Cross Curricular Links – TBC

KS1 - Key Vocabulary, Key Skills and Cross Curricular Links

KS1

CYCLE A

AUTUMN TERM 1

Introduction to Plants

Key Vocabulary	data, deciduous, diagram edible, evergreen, feature fruit, flower, garden plants grouping, growth, investigation leaf, measure, observe plant, prediction, roots research, seed, shoot stem, trunk, wild plants
Outcome: most pupils 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. • Recall that seeds and bulbs come from plants. • Recognise that seeds need water for growth. • 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. • 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.
Key Skills	**Posing questions** Exploring the world around them and raising their own simple questions. Recognising 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 it with personal experience. **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. **Researching** Gathering specific information from one simplified, specified source. **Recording (diagrams)** Drawing and labelling simple diagrams. **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.
Key Knowledge	To know: A variety of common plants and how they differ. Deciduous trees lose their leaves seasonally but evergreen trees do not. The basic structure, including leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches and stem, of a variety of common plants, including flowering plants and trees. To begin to understand how plants grow and change over time. **Science in action**

	To know: About famous scientists throughout history. About the work of modern-day scientists. There are spiritual, moral, social and cultural links with Science.
Cross Curricular Links	**English:** Composing sentences before writing; punctuating sentences with capital letters and full stops. **Maths:** Comparing and measuring leaf lengths. **Art**: Drawing flowering plants. **Computing**: Using devices to capture images and video. **Music**: Listening to and joining in with songs. **Geography**: Carrying out fieldwork on the school grounds. **History**: Recognising the significance of scientists in the past. **British values:** Mutual respect.

KS1

CYCLE A

AUTUMN TERM 2

Seasonal Changes

Key Vocabulary	conclusion, data, deciduous tree, evergreen tree, pictogram, predict, record, season, sunrise, sunset, symbol, temperature, thermometer, weather
Outcome: most pupils 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. Label a map of the UK with capital cities and seasonal weather symbols. **Working scientifically** Complete a pictogram and use it to answer simple questions. Record data about the temperature across the four seasons.
Key Skills	**Posing questions** Exploring the world around them and raising their own simple questions. **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)** Using a prepared table to record tally frequency. **Graphing** Representing data using pictograms. **Analysing and drawing conclusions** Using their results to answer simple questions.
Key Knowledge	To know: The name and order of the four seasons; spring, summer, autumn and winter. That it is unsafe to look directly at the Sun.

	The weather associated with the four seasons and how it changes (in the UK). That day length varies across the four seasons, with fewer daylight hours in the winter and more in the summer. **Science in action** To know about a range of jobs and careers that use scientific knowledge and methods, e.g. weather reporter.
Cross Curricular Links	**Maths**: Measurement. **Geography**: Human and physical geography, Locational knowledge. **English**: Spoken language. **British values**: Mutual respect.

KS1

CYCLE A

SPRING TERM 1

Habitats

Key Vocabulary	alive, analyse, camouflage carnivore, classify, coastal dead, depend, diet energy, excretion, food chain growth, habitat, herbivore life process, mammal, movement nutrition, ocean, omnivore predator, prey, producer rainforest, reproduction, sensitivity shelter, woodland
Outcome: most pupils 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 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.

Key Skills	**Posing questions** Exploring the world around them and raising their own simple questions. Recognising there are different types of enquiry (ways to answer a question). **Researching** Gathering specific information from one simplified, specified source. **Recording (tables)** Using a prepared table to record results including simple observations. **Grouping and classifying** Grouping based on visible characteristics.
Key Knowledge	To begin to understand some of the life processes, including movement, reproduction, sensitivity, growth, excretion and nutrition. To know the difference between things that are living, dead, and things that have never been alive, using some of the life processes. To know a variety of plants and animals and describe some differences. To name a variety of habitats, including woodland, ocean, rainforest and coastal. To know that a habitat is the environment where an animal or plant lives/grows because it provides what they need to survive. To know that living things depend upon each other (e.g. for food, shelter.) To understand that a food chain can be used to show how animals obtain food from eating either plants and/or other animals.
Cross Curricular Links	**English:** Presentations. **Computing**: Retrieving information online. **Geography**: Physical features. **British values**: Mutual respect.

KS1

CYCLE A

SPRING TERM 2

Life Cycles and Health

Key Vocabulary			
	adult	air	baby
	basic needs	butterfly	child
	carbohydrates	caterpillar	dairy
	egg	exercise	fitness
	food	frog	froglet
	fruit	germs	growth
	health	height	hygiene
	lamb	life cycle	live young
	measure	offspring	oils
	proteins	pupa	sheep
	spawn	spreads	stage
	survive	tadpole	teenager
	toddler	vegetables	water

Outcome: most pupils 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. **Working scientifically** Measure using simple equipment. Record results in a table. Use data to answer a simple question. Research using secondary sources.
Key Skills	**Posing questions** Recognising there are different types of enquiry (ways to answer a question). **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. **Researching** Gathering specific information from one simplified, specified source. **Recording (tables)** Using a prepared table to record results including numbers. **Analysing and drawing conclusions** Using their results to answer simple questions. .
Key Knowledge	To know… That baby, toddler, child, teenager and adult are human life cycle stages. There are differences in the life cycles of different animals. Humans grow as they age. The basic survival needs of animals are air, water and food. Personal hygiene prevents the spread of germs. Washing our hands and changing our clothes are ways to keep clean. Exercise can improve performance and well-being. The five food groups are carbohydrates, fruits and vegetables, dairy and alternatives, protein and oils and spreads. Humans require a balanced diet to stay healthy.
Cross Curricular Links	**English**: reading non-fiction, explaining understanding of a text. **Maths**: measurement, compare and sequence intervals of time **Design and technology:** balanced diet and healthy food choices. **RSE:** principles of planning healthy meals. **British values**: mutual respect

KS1

CYCLE A

SUMMER TERM 1

Plant Growth

Key Vocabulary	bulb	comparative test	conclusion
	condition	diagram	energy
	flower	germinate	growth
	leaf	life cycle	measure
	nutrient	observe	plant
	shoot	seed	seedling
	seed coat	stem	wilt
Outcome: most pupils 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 healthy plant growth. Describe the influences humans have on plants in the environment. **Working scientifically** 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.
Key Skills	**Posing questions** Exploring the world around them and raising their own simple questions. Recognising there are different types of enquiry (ways to answer a question). 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 it with personal experience. **Observing** 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 (diagrams)** Drawing and labelling simple diagrams. **Recording (tables)** Using a prepared table to record results including: numbers; simple observations. **Analysing and drawing conclusions** Using their results to answer simple questions. Beginning to recognise when results or observations do not match their predictions. .
Key Knowledge	To know… Seeds and bulbs grow into seedlings by producing roots and shoots. Seedlings grow into mature plants by developing parts such as roots, stems, leaves and flowers. Seeds need water and warmth to germinate. Plants need water, light and a suitable temperature for growth and health. **Science in action** To know: A range of jobs and careers that use scientific knowledge and methods. There are spiritual, moral, social and cultural links with Science.
Cross Curricular Links	**Maths:** using rulers to measure stem height; recording data in a table. **British values:** mutual respect.

KS1

CYCLE A

SUMMER TERM 2

Making Connections Unit (TBC: Published by Kapow June 2025)

Key Vocabulary	
Outcome: most pupils will be able to	
Key Skills	.
Key Knowledge	
Cross Curricular Links	

KS1

CYCLE B

AUTUMN TERM 1

Sensitive Bodies

Key Vocabulary	action, bitter, blind body, compare, data direction, distance, feeling group, hearing, investigation loud, obstacle, pattern quiet, research, salty sense, senses, sensitive sight, smell, sour sweet, taste, touch volume
Outcome: most pupils will be able to	Draw and label human body parts. Identify the body parts associated with each sense. **Working scientifically** 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 Skills	**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. .
Key Knowledge	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** 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.
Cross Curricular Links	**Mathematics:** Measure and begin to record lengths; count, read and write numbers to 100. **English:** Word reading, transcription. **British values:** Democracy, mutual respect.

KS1

CYCLE B

AUTUMN TERM 2

Everyday Materials

Key Vocabulary	absorbent, data, fabric glass, group, material metal, object, opaque plastic, property, rock tough, transparent, waterproof wood
Outcome: most pupils 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. **Working Scientifically** 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 Skills	**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. .
Key Knowledge	To know: That objects are items or things. That a material is what an object is made from. A variety of everyday materials, including wood, plastic, glass, metal, water and rock. That property refers to how a material can be described. Materials can be grouped based on their physical properties.
Cross Curricular Links	**English:** Pleasure in reading **British values:** Mutual respect

KS1

CYCLE B

SPRING TERM 1

Comparing Animals

Key Vocabulary	amphibian	bird	block chart
	body	carnivore	compare
	data	diet	differences
	feature	fish	group
	herbivore	hunt	mammal
	observe	omnivore	pet
	record	reptile	research
	scientist	similarities	tally
Outcome: most pupils 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. **Working Scientifically**		

	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 Skills	**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. .
Key Knowledge	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.
Cross Curricular Links	**English:** Writing – capital letters and full stops, pronoun 'I'. **Maths:** Number – counting, block charts, more than, less than, most and least. **British values:** Mutual respect.

KS1

CYCLE B

SPRING TERM 2

Uses of Everyday Materials

Key Vocabulary	bend, block graph, elastic, fabric, flexible, glass, material, metal, object, plastic, property, pull, push, record, rock, squash, stretch, suitable, twist, wood
Outcome: most pupils 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. **Working Scientifically** Measure using non-standard units. Recording results in a table. Use data to answer a simple question. Record results in a block graph.

Key Skills	**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. .
Key Knowledge	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.
Cross Curricular Links	**English**: using co-ordination **Maths**: measurement, fractions of shapes, multiplication **British values**: being responsible and contributing to society

KS1

CYCLE B

SUMMER TERM 1

Microhabitats

Key Vocabulary	botanist, camouflage, characteristics classification key, classify, comparative/fair test conclusion, criteria, data food chain, identify, invertebrate method, microhabitat, minibeast research, results, species survey, tally, test
Outcome: most pupils 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. **Working Scientifically** 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 Skills	**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. .
Key nowledge	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.
Cross Curricular Links	**English**: using co-ordination **Maths**: measurement, fractions of shapes, multiplication **British values**: being responsible and contributing to society

KS1

CYCLE B

SUMMER TERM 2

Making Connections B

(Unit released by Kapow June 2025)

Key Vocabulary	
Outcome: most pupils will be able to	
Key Skills	.
Key Knowledge	
Cross Curricular Links	

LKS2 - Key Vocabulary, Key Skills and Cross Curricular Links

LKS2

CYCLE A

AUTUMN TERM 1

Light and Shadows

Key Vocabulary	cast a shadow dangerous light source luminous non-luminous opaque protect reflect reflection reflective (shiny) shadow shadow puppet translucent transparent
Outcome: most pupils 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 to make a shadow puppet and use knowledge of shadows to animate it. **Working Scientifically** 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 improvement to 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 Skills	**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** Making predictions about what they think will happen by using scientific knowledge and/or personal experience to explain their prediction. **Observing** Using their senses to describe, in more detail and with simple scientific vocabulary, what they notice or what has changed. **Measuring** Using standard units to measure and compare. Using measuring equipment with increasing accuracy. Reading scales with unmarked intervals between numbers. **Recording** 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. **Graphing** Reading the value of bars with greater accuracy. **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 quote results as evidence of relationships. Identifying data that does not fit a pattern (anomalous data). Recognising when results or observations do not match their predictions. 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. Beginning to identify new questions that would further the enquiry. .
Key **Knowledge**	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.
Cross Curricular Links	**English**: Spoken language, Reading – comprehension. **Mathematics**: Number and place value, Measurement. **Geography:** Locational knowledge, Place knowledge. **British values**: Mutual respect, Democracy.

LKS2

CYCLE A

AUTUMN TERM 2

Movement and Nutrition

Key Vocabulary	balanced diet, bone, carbohydrate endoskeleton, exoskeleton, fat fibre, invertebrate, joint mineral, movement, muscle nutrient, protection, protein skeleton, support, vertebrate vitamin, water
Outcome: most pupils will be able to	Recall the three key functions of the skeleton (movement, support and protection). Describe a vertebrate, invertebrate, endoskeleton and exoskeleton and use this information to group animals. Identify and name the skull, spine, ribs and pelvis on a diagram. Recall that muscles cause movements in the body, some of which we can control consciously. Describe that muscles can 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 nutrient groups 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. **Working Scientifically:** Record measurements of different bones and use the data to sort them into size order. Describe some ways scientific research has improved the field of bionics/prosthetics, such as the choice of materials or linking their movement to

	muscles in the arm. Find relevant data on food packaging and make numerical comparisons.
Key Skills	**Measuring** Using standard units to measure and compare. Using measuring equipment with increasing accuracy. Reading scales with unmarked intervals between numbers. **Recording** Using a prepared table to record results including more detailed observations. **Analysing** Writing a conclusion to summarise findings using simple scientific vocabulary. **Evaluating** Beginning to identify new questions that would further the enquiry. .
Key Knowledge	To know that animals can be grouped based on the presence of a skeleton. To know that the skeleton in humans and some animals is used for movement, protection and support. To know that the muscular system in humans and some animals works with the skeleton for movement. To know the main bones in the body. To know that animals, including humans, need the right types and amount of nutrition. To understand that humans cannot make their own food and therefore eat to get the nutrition needed. To know the main food groups (carbohydrates, protein, fats, fibre, vitamins, minerals and water) and their simple functions. To know that a balanced diet should include all food groups. To describe the diets of different animals.
Cross Curricular Links	**Mathematics:** Number and place value, Number – addition and subtraction, Measurement **English:** Spoken language, Reading **Design and technology** **RSE** **British values:** Mutual respect, Tolerance of those with different faiths and beliefs

LKS2

CYCLE A

SPRING TERM 1

Rocks and Soil A

Key Vocabulary	absorbency	acid rain	bone
	clay	clay soil	crystal
	earthworm	era	fossil
	fossil record	grain	hard
	hardness	impermeable	igneous rock
	imprint	lava	loam soil
	magma	metamorphic rock	mineral
	molten rock	organic matter	paelantologist
	peaty soil	permeable	rate
	rock	sandy	sandy soil
	sediment	sedimentary	sedimentation
	silt	soft	soil

Outcome: most pupils 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. **Working Scientifically** 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 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.
Key Skills	**Measuring** Using standard units to measure and compare. Using measuring equipment with increasing accuracy. Reading scales with unmarked intervals between numbers. **Recording** Using a prepared table to record results including more detailed observations. **Analysing** Writing a conclusion to summarise findings using simple scientific vocabulary. **Evaluating** Beginning to identify new questions that would further the enquiry. .
Key Knowledge	**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.
Cross Curricular Links	**Mathematics:** Statistics **British values:** Mutual respect

LKS2

CYCLE A

SPRING TERM 2

Digestion and Food

Key Vocabulary	absorb, canine, carnivore, digest, faeces, food chain, herbivore, incisor, large intestine, molar, mouth, oesophagus, omnivore, predator, premolar, prey, producer, saliva, small intestine, stomach
Outcome: most pupils 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.

	Working Scientifically 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.
Key Skills	**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 (accurate measurements and maintaining control variables). .
Key Knowledge	To know the main organs of the human digestive system (mouth, teeth, tongue, oesophagus, stomach, small and large intestines) and describe their simple functions. To know the different types of human teeth (incisor, canine, premolar and molar) and their simple functions. To know that teeth can be damaged, including the effect of sugary and acidic food. To know that it is important to brush teeth twice a day, make good food choices and visit the dentist regularly. To describe the teeth of carnivores and herbivores, and understand why they are different. To know that predators hunt for their food and prey are the animals being hunted. To know that producers make their own food. To know that food chains begin with a producer followed by consumers, and arrows to show the energy passed on.
Cross Curricular Links	**English**: Spoken language, Writing. **Mathematics**: Number – Addition and subtraction, Number and place value, Measurement, Statistics. **British values**: Rule of law, Mutual respect, Tolerance of different cultures and religions. **Geography.** **RSE & PSHE.**

LKS2

CYCLE A

SUMMER TERM 1

Electricity and Circuits

Key Vocabulary	ammeter, appliance, battery bulb, buzzer, cell circuit, component, electrical conductor electrical insulator, electricity, hazard mains, material, motor power source, precaution, property safety, series circuit, switch wire
Outcome: most pupils 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 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 diagrams, electrical components, conductors or insulators. **Working Scientifically** 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.
Key Skills	**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. .
Key	To know: That all electrical appliances need a power source, including batteries or mains electricity. That an electrical circuit needs a complete path for the electrical charge to flow through. The main components in a series circuit.

Knowledge	The precautions for working safely with electricity. That some materials allow electric charge to pass through them quickly and these are known as electrical conductors (e.g. metals). That some materials do not allow electrical charge to pass through them easily and these are known as electrical insulators (e.g wood and plastic). That metals are used for cables and wires because they are good conductors of electricity. That plastic is used to cover cables and wires because it is a good insulator. That an open switch breaks a series circuit so the components will be off. That 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.
Cross Curricular Links	**English**: Spoken language, Writing. **Mathematics**: Geometry – properties of shapes. **Design and technology.** **British values**: Rule of law, Mutual respect. **RSE & PSHE.**

LKS2

CYCLE A

SUMMER TERM 2

Making Connections A

(Unit Released by Kapow June 2025)

Key Vocabulary	
Outcome: most pupils will be able to	
Key Skills	
Key Knowledge	
Cross Curricular Links	

LKS2

CYCLE B

AUTUMN TERM 1

Forces and Magnets

Key Vocabulary	attract contact force electromagnet force friction magnet magnetic material magnetism non-contact force non-magnetic material north pole repel south pole
Outcome: most pupils will be able to	Identify examples of pushes, pulls and twists. Define a force, including describing, naming and 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. **Working Scientifically** 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. 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.
Key Skills	**Planning** Beginning to select from options which variables will be changed, measured and controlled.

	Suggesting what observations to make and how long to make them for. Planning a simple method, verbally and in writing. **Researching** Gathering specific information from a variety of sources. **Recording** Beginning to draw more scientific diagrams by labelling with more scientific vocabulary and using arrows. Representing data using bar charts. **Analysing** Writing a conclusion to summarise findings using simple scientific vocabulary. Beginning to suggest how one variable may have affected another. Beginning to quote results as evidence of relationships. **Science in action** Exploring the uses of friction and magnets in everyday life and industry.
Key Knowledge	Examples of contact and non-contact forces. Some forces are a result of contact between two surfaces but some forces can act at a distance (e.g. magnetism). Magnets have a north and south pole. Some examples of magnetic materials, including iron and nickel, and how they react to a magnet and each other. Some different examples of magnets, including bar, horseshoe, button and ring. Some uses of magnets. Friction is a contact force that acts between two surfaces to slow an object down. Magnetism is a non-contact force that affects objects containing magnetic metal. The opposite poles of a magnet attract one another and like poles repel one another. Rougher surfaces have more friction between them than smoother surfaces. The strength of different magnets may vary.
Cross Curricular Links	**English:** Writing, non-fiction writing. **Maths:**Measurement, measuring length. Statistics, drawing bar charts. **British values:** Mutual respect.

LKS2

CYCLE B

AUTUMN TERM 2

States of Matter

Key Vocabulary	boiling point	climate change	compress
	condensation	condensing	condensing point
	drought	evaporating	evaporation rate
	flood	force	freezing
	freezing point	gas	gaseous
	liquid	matter	melting
	melting point	precipitation	rate
	solid	state	steam
	temperature	thermometer	the water cycle
	volume	water vapour	
Outcome: most pupils 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. **Working Scientifically** Ask relevant questions.		

	Use results to draw simple conclusions. Use thermometers to take accurate measurements. Make predictions for new values. Record findings using labelled diagrams. Research using more than one source.
Key Skills	**Posing questions** Considering what makes a testable question. **Measuring** Using standard units to measure and compare. Using measuring equipment with increasing accuracy. **Recording** Drawing in 2D to produce simple line diagrams. Labelling diagrams with more scientific vocabulary. **Researching** Gathering specific information from a variety of sources. **Analysing and drawing conclusions** Beginning to use identified patterns to predict new values or trends. Writing a conclusion to summarise findings using simple scientific vocabulary.
Key Knowledge	To know That all substances around us can exist as solids, liquids and gases. That a property of a solid is that it keeps its shape unless a force is applied to it. That a property of a liquid is that it can flow freely and take on the shape of a container. That a property of a gas is that it does not have a fixed shape and can escape from an unsealed container. That heating causes solids to turn into liquids (melting) and liquids to turn into gases (evaporating). That cooling causes gases to turn into liquids (condensing) and liquids to turn into solids (freezing). That water can exist as a solid, a liquid or a gas. That the melting point of water is zero degrees Celsius and the boiling point of water is 100 degrees Celsius. That water flows around the world in a continuous process called the water cycle. That in the water cycle, evaporation is when bodies of water are heated and turn into water vapour. That in the water cycle, condensation is the process of water vapour cooling to form water droplets in clouds, which can result in precipitation. That the rate of evaporation increases as temperature rises.
Cross Curricular Links	**British values:** Mutual respect.

LKS2
CYCLE B

SPRING TERM 1
Rocks and Soil B

Key Vocabulary	absorbency	acid rain	bone
	clay	clay soil	crystal
	earthworm	era	fossil
	fossil record	grain	hard
	hardness	impermeable	igneous rock
	imprint	lava	loam soil
	magma	metamorphic rock	mineral
	molten rock	organic matter	paelantologist
	peaty soil	permeable	rate
	rock	sandy	sandy soil
	sediment	sedimentary	sedimentation
	silt	soft	soil

Outcome: most pupils 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. **Working Scientifically** 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 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.
Key Skills	**Measuring** Using standard units to measure and compare. Using measuring equipment with increasing accuracy. Reading scales with unmarked intervals between numbers. **Recording** Using a prepared table to record results including more detailed observations. **Analysing** Writing a conclusion to summarise findings using simple scientific vocabulary. **Evaluating** Beginning to identify new questions that would further the enquiry. .
Key Knowledge	**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.
Cross Curricular Links	**Mathematics:** Statistics **British values:** Mutual respect

LKS2

CYCLE B

SPRING TERM 2

Sound and Vibrations

Key Vocabulary	air, decibels (dB), decibel meter ear, eardrum, ear protectors gas, hertz (Hz), high pitch insulator of sound, liquid, loud low pitch, matter, medium musical instrument, pitch, quiet solid, sound, sound proofing vibration, volume
Outcome: most pupils 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. **Working Scientifically** To observe closely how different 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.
Key Skills	**Measuring** Using standard units to measure and compare. Using measuring equipment with increasing accuracy. Reading scales with unmarked intervals between numbers. **Recording** Using a prepared table to record results including more detailed observations. **Analysing** Writing a conclusion to summarise findings using simple scientific vocabulary. **Evaluating** Beginning to identify new questions that would further the enquiry. .
Key Knowledge	**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.
Cross Curricular Links	**Mathematics:** Statistics **British values:** Mutual respect

LKS2

CYCLE B

SUMMER TERM 1

Classification and Changing Habitats

Key Vocabulary	Carroll diagram, classification key, classify, conservation, conservationist, deforestation, earthquake, endangered, flood, flowering plants, human impact, invertebrate, observe, nature reserve, non-flowering plants, pollution, seasonal changes, taxonomist, uprooted, vertebrate, Venn diagram, waterlogged, wildfire
Outcome: most pupils will be able to	Group animals in various ways, including vertebrates (mammals, birds, reptiles, amphibians, fish) and invertebrates. Group plants in various ways, including flowering and non-flowering plants. Recognise and describe different habitats and their inhabitants. Recognise the impact humans can have on habitats. Recognise the impact of natural disasters on habitats. **Working Scientifically** Record data in different ways. Apply and create classification keys. Make careful observations. Make and use classification keys. Present information in different ways.

	Research using an information sheet.
Key Skills	**Observing** Using their senses to describe, in more detail and with simple scientific vocabulary, what they notice or what has changed. **Recording** Recording data in Carroll and Venn diagrams. Using a prepared table to record results, including more detailed observations. Using tables with more than two columns. **Grouping and classifying** Grouping based on visible characteristics and measurable properties. Populating a pre-prepared branching and number key. Choosing appropriate questions for classification keys. **Researching** Gathering specific information from a variety of sources. .
Key Knowledge	To know: Living things can be grouped in different ways. A classification key can be used to group and identify plants and animals. Vertebrates are animals that have a backbone and invertebrates are animals that do not have a backbone. Plants can be grouped into flowering or non-flowering varieties. Flowering plants include grasses and non-flowering plants include ferns and mosses. There are five main vertebrate groups: birds, mammals, reptiles, amphibians and fish. Invertebrate groups include snails, slugs, worms, spiders and insects. Habitats can change throughout the year, which can be dangerous for living things. Humans can have both a positive and negative impact on the environment.
Cross Curricular Links	**Mathematics:** Statistics **English:** Reading – comprehension **British values:** Mutual respect

LKS2

CYCLE B

SUMMER TERM 2

Making Connections B

(Unit Released by Kapow June 2025)

Key Vocabulary	
Outcome: most pupils will be able to	
Key Skills	.
Key Knowledge	
Cross Curricular Links	

UKS2 - Key Vocabulary, Key Skills and Cross Curricular Links

UKS2

CYCLE A

AUTUMN TERM 1

Life Cycles and Reproduction

Key Vocabulary	adolescence	adult	amphibian	hatchling	herbivore	incubation
	asexual reproduction	bird	birth	infancy	insect	juvenile
	bulb	carnivore	characteristic	larva	leaf growing stage	life cycle
	chrysalis	cocoon	conclusion	line graph	line of best fit	lungs
	cuttings	egg	estimating	mammal	mating	metamorphosis
	extrapolating	fertilisation	fledgling	nest	nestling	newborn
	flowering stage	four-legged tadpole	four-stage life cycle	nymph	offspring	ovule
	frog	froglet	germination stage	pollen	pollination	predict
	gestation	gills	hatch	pupa	reproduction	seed dispersal
	seed stage	seedling stage	seed			
	sexual reproduction	species	tadpole			
	three-stage life cycle	tuber	two-legged tadpole			

Outcome: most pupils 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. **Working Scientifically** 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. Represent root growth over time on a line graph.
Key Skills	**Posing questions** Raising questions throughout the enquiry process. Identifying testable questions. **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. **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). **Researching** Gathering answers to open-ended questions from a variety of sources. **Recording** 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** Suggesting with increasing independence how one variable may have affected another. Quoting relevant data as evidence of relationships. Using identified patterns to predict new values or trends.

Key Knowledge	To know: A life cycle shows the changes an animal or plant goes through until the reproduction of a new generation when the cycle starts again. All living things must reproduce for the species to survive. Sexual reproduction requires two parents whereas asexual reproduction only requires one parent. There are different processes plants and animals use to reproduce (asexual and sexual reproduction). **Science in action** To know: There are a range of jobs and careers that use scientific knowledge and methods. There is current scientific research taking place with aims for achievement in the future. Scientific evidence is used to support or refute ideas or arguments.
Cross Curricular Links	**English**: Reading – comprehension. **Maths:** Measurement. **British values**: Mutual respect.

UKS2

CYCLE A

AUTUMN TERM 2

Unbalanced Forces

Key Vocabulary	aerodynamics, air resistance, amplify, balanced, contact force, distance, effort, force, friction, gear, gravity, lever, load, machine, mass, matter, non-contact force, pivot, pulley, streamlining, surface area, unbalanced, water resistance
Outcome: most pupils will be able to	Describe gravity and its effects. Describe the relationship between mass and gravity. Describe air resistance and its effects. Describe friction and its effects. Describe water resistance and its effects. Describe the relationship between surface area and air and water resistance. Explain how to make an object aerodynamic or streamlined. Describe the effects of levers, pulleys and simple machines on movement.

	Working Scientifically Analyse predictions, data and anomalies to write a conclusion. Plan a fair test to investigate air resistance. Write a method. Evaluate a method and judge the degree of trust. Design a results table. Calculate the mean average from repeat data. Draw and annotate a diagram. To draw an accurate line graph.
Key Skills	**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 that includes 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. **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 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. 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** 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** 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 also reflecting on: accuracy (human error with equipment); reliability (repeating results); sources of information (e.g. websites, books). Deciding what data to collect to test direct relationships further.
Key Knowledge	To know: Gravity is a non-contact force that pulls objects together. Air resistance and water resistance are both types of friction. Unsupported objects fall towards the Earth because of gravity. Friction, air resistance and water resistance act in the opposite direction of a moving object. When forces are unbalanced, the speed, shape or direction of an object changes. When forces are balanced, the speed, shape or direction of an object stays the same. Some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. Rougher surfaces have more friction between them than smoother surfaces and how that may affect movement. The larger the surface area of an object, the greater the air or water resistance it creates. **Science in action** To know: About famous scientists throughout history.
Cross Curricular Links	**English**: Reading – comprehension. **Maths:** Measurement, data handling, graphs, calculating averages, **British values**: Mutual respect.

UKS2

CYCLE A

SPRING TERM 1

Classifying Big and Small

Key Vocabulary	amphibian	binomial system	bird
	characteristic	classify	classification key
	cold-blooded	conifer	exoskeleton
	fern	fish	flowering plant
	insect	invertebrate	life process
	Linnaean system	mammal	micro-organism
	microscopic	moss	organism
	reptile	snail	spider
	vertebrate	warm-blooded	worm
Outcome: most pupils 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'. 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. **Working Scientifically** Use a classification key to group and identify organisms. Make a simple classification key.
Key Skills	**Grouping and classifying** Grouping in a broader range of contexts. Organising the layout of number and branching keys. Formulating appropriate questions for classification keys.
Key Knowledge	To know that ‘organism’ is a term used to refer to an individual living thing. To know that micro-organisms are incredibly small and cannot usually be seen by the naked eye. To know the characteristics of the different groups of vertebrates and commonly found invertebrates. **Science in action** To know about famous scientists throughout history.
Cross Curricular Links	**British values:** mutual respect. **Art:** clay sculpture. **English:** writing.

UKS2

CYCLE A

SPRING TERM 2

Circuits, Batteries and Switches

Key Vocabulary	ammeter	appliance	battery
	bulb	buzzer	cell
	circuit	circuit diagram	component
	current	electricity	motor
	power source	resistance	switch
	voltage	voltmeter	wire
Outcome: most pupils 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 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. **Working Scientifically** 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.		

Key Skills	**Planning** Suggesting which variables will be changed, measured and controlled. Writing a method including details about ensuring 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** 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. **Observing and measuring** Using their senses to describe, in detail and with a broader range of scientific vocabulary, what they notice or what has changed. 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 by using a wider range of standard symbols and drawing with increasing accuracy. 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. **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. 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** 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.
Key Knowledge	A variety of components in a series circuit (including buzzer and motor). Conventions are used to draw circuit diagrams, including the recognised symbols for common components and using straight lines. The voltage of a circuit can be changed and this affects bulb brightness (or buzzer volume). **Science in action** A range of jobs and careers that use scientific knowledge and methods. How scientific evidence is used to support or refute ideas or arguments.
Cross Curricular Links	**English**: Spoken language. **Mathematics**: Number – addition, subtraction, multiplication and division, Measurement, Statistics. **Design and technology:** Design, Technical knowledge. **British values**: Mutual respect, Democracy.

UKS2

CYCLE A

SUMMER TERM 1

Evolution and Inheritance

Key Vocabulary	adaptation	ancestor	characteristic
	competition	environmental	evidence
	evolution	extinct	fossil
	gene	habitat	inherit
	natural selection	offspring	peer review
	population	reproduce	scientific theory
	selective breeding	species	specimen
	survival	survival of the fittest	variation
Outcome: most pupils will be able to	Define and identify variation in organisms and recall that it is caused by inherited and environmental factors. Recall that living things produce offspring of the same kind but are not normally identical to their parents. Describe patterns of inheritance from parent to offspring in a given example or family tree. Describe what an adaptation is; it cannot be chosen and is usually inherited. Describe key characteristics that would help an organism to survive and explain how an adaptation helps the organism to survive. Explain how variation may affect survival within a population and recall what natural selection means. Recall what evolution is, identify differences between a living thing and its ancestor and describe key steps in the evolution of a species. Recall different types of evidence that can be used to explain evolution and describe methods that make scientists' results or conclusions more trustworthy. **Working Scientifically** Sort variation as environmental, inherited or a mixture of both. Evaluate a method by recalling variables that were effectively kept the same and those that were harder to control. Comment on the reliability of the results and the degree of trust. Consider how evidence is used to form theories and the degree of trust the evidence offers.		

Key Skills	**Posing questions** Raising questions throughout the enquiry process. Selecting the most appropriate enquiry method to answer questions and give justification. **Planning** Suggesting which variables will be changed, measured and controlled. **Observing** Using senses to describe, in detail and with a broader range of scientific vocabulary, what is noticed or what has changed. **Recording** Using tables with columns that allow for repeat readings. Calculating the mean average. **Grouping and classifying** Grouping in a broader range of contexts. **Analysing and drawing conclusions** 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. **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). Posing new questions in response to the data that would extend the enquiry.
Key Knowledge	Living things have changed over time. Fossils provide information about living things that inhabited the Earth millions of years ago. Characteristics are passed from parents to their offspring, but all offspring vary from their parents. Over time, variation in offspring can affect animals' chances of survival in particular environments. Animals and plants have adapted to suit their environment over many millions of years and this process can be called evolution. **Science in action** Famous scientists throughout history. A range of jobs and careers use scientific knowledge and methods. The work of modern-day scientists. 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. Scientific evidence is used to support or refute ideas or arguments.
Cross Curricular Links	**English**: Spoken language, Reading – comprehension. **Mathematics**: Number – addition, subtraction, multiplication and division, Statistics. **Geography:** Place knowledge, Human and physical geography. **History:** Using sources. **British values**: Mutual respect, Democracy, Tolerance of those with different faiths and beliefs.

UKS2

CYCLE A

SUMMER TERM 2

Humans Timeline

Key Vocabulary	adolescence	adolescent	adult
	adulthood	child	childhood
	foetus	gestation period	hormones
	infant	life cycle	newborn
	old age	period (menstruation)	puberty
	toddler		
Outcome: most pupils 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. **Working Scientifically** 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 on the scatter graph.		

Key Skills	**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. Quoting relevant data as evidence of relationships. Using identified patterns to predict new values or trends. **Evaluating** Commenting on the degree of trust by also reflecting on the sources of information (e.g. websites, books). Deciding what data to collect to further test direct relationships.
Key Knowledge	How to describe the human life cycle, including the stages of growth and development (baby, toddler, child, teenager, adult, elderly). How to describe changes that occur during puberty (in boys and girls). Gestation periods vary across mammals. **Science in action:** A range of jobs and careers that use scientific knowledge and methods. The methods and equipment used by scientists throughout history and how these have led to modern methods.
Cross Curricular Links	**English**: Spoken language. **Mathematics**: Number – number and place value, Statistics. **RSE**: Changing adolescent body. **Art** **British values**: Rule of law, Democracy, Mutual respect.

UKS2

CYCLE A

SUMMER TERM – OPTIONAL ADDITIONAL UNIT

Making Connections B

(Unit Released by Kapow June 2025)

Key Vocabulary	
Outcome: most pupils will be able to	
Key Skills	
Key Knowledge	.
Cross Curricular Links	

UKS2

CYCLE B

AUTUMN TERM 1

Mixtures and Separation

Key Vocabulary	control variable, crystallising, dissolve, evaporation, evaporation method, filtering, insoluble, mixture, particle, sieve, sieving, soluble, solution, variable
Outcome: most pupils 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. **Working Scientifically** 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 Skills	**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.
Key Knowledge	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.
Cross Curricular Links	**British values:** mutual respect.

UKS2

CYCLE B

AUTUMN TERM 2

Properties and Changes of Materials

Key Vocabulary	burning, change of state, circumference, condensing, conductor, dissolve, electrical conductivity, evaporating, freezing, hard, hardness, insulator, irreversible change, light intensity, light meter, melting, mixture, opaque, property, reversible change, rust, rusting, soft, states of matter, trustworthy, thermal conductivity, translucent, transparency, transparent
Outcome: most pupils 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. **Working Scientifically** 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 Skills	**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).
Key Knowledge	To describe a broader range of materials and their properties, including hardness, solubility, transparency, conductivity and response to magnets. To know that dissolving, mixing and changes of state are reversible changes. To know that some changes result in the formation of new materials and that these are usually irreversible. (e.g. burning, rusting, the action of acid on bicarbonate of soda.)
Cross Curricular Links	**British values:** mutual respect.

UKS2

CYCLE B

SPRING TERM 1
Earth and Space

Key Vocabulary	artificial satellite, axis, calibrate, phase, planet, Pluto celestial bodies, climate change, day, orbit, our Solar System, reflect daytime (daylight), data, Earth, rotate, Saturn, season elliptical, face, first quarter moon, shadow, Solar System, space force, full moon, gnomon, space junk, spherical, star gravity, horizon, Jupiter, summer, sundial, sunrise last quarter moon, Mars, Mercury, sunset, table, the Sun midday, moon, natural satellite, the Moon, tilt, Uranus Neptune, new moon, night (nighttime), Venus, winter, year
Outcome: most pupils 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. **Working Scientifically** 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 Skills	**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.
Key Knowledge	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 To know about famous scientists throughout history. To know how scientific knowledge has changed over time, leading to the current understanding of Science. To know that mistakes can lead to new discoveries. To know about the work of modern day scientists. To know about science in the news and recent discoveries. To know about the methods and equipment used by scientists throughout history and how these have led to modern methods. To know about current scientific research and what it aims to achieve in the future. To know that collaboration and peer reviewing is essential for effective scientific progress.
Cross Curricular Links	**Mathematics**: Measurement. **Design and technology**: Design, Make. **History**: Using sources, Early civilisations. **British values**: Mutual respect.

UKS2

CYCLE B

SPRING TERM 2

Circulation and Health

Key Vocabulary	balanced diet, blood, bloodstream blood vessels, carbon dioxide, circulatory system diet, drug, exercise fitness, health, heart heart rate, lifestyle, lungs mass, nutrient, oxygen pulse, pump (verb), rate resting heart rate, transport, water
Outcome: most pupils 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.

	Working Scientifically 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 Skills	**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 detail 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).
Key Knowledge	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.
Cross Curricular Links	**English**: Spoken language, Reading, Writing – composition. **Mathematics**: Number – number and place value, Measurement, Statistics. **Design technology:** Cooking and nutrition. **RSE:** Mental wellbeing, Physical health and fitness, Healthy eating, Drugs, alcohol and tobacco, Health and prevention. **Physical education** **British values**: Rule of law, Mutual respect.

UKS2

CYCLE B

SUMMER TERM 1

Light and Reflection

Key Vocabulary	cast, incoming ray, light ray light source, luminous, mirror non-luminous, opaque, periscope pupil, ray diagram, reflected ray reflective, shadow, straight
Outcome: most pupils 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 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. **Working Scientifically** 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 Skills	**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 detail 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).
Key Knowledge	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.
Cross Curricular Links	**English**: Spoken language, Writing. **Mathematics**: Number – addition, subtraction, multiplication and division, Measurement, Statistics, Geometry – properties of shapes. **British values**: Mutual respect, Democracy, Rule of law.

UKS2

CYCLE B

SUMMER TERM 2

Making Connections A

(Unit Released by Kapow June 2025)

Key Vocabulary	
Outcome: most pupils will be able to	
Key Skills	
Key Knowledge	
Cross Curricular Links	