Key Stage 2
Science curriculum

Science is among the mandatory subjects that must be taught at all state-funded schools during KS2. In addition to this, the National Curriculum outlines a list of topics that should be covered by teachers in science lessons.

The KS2 Science Curriculum is designed to give children the foundational knowledge required for understanding the world around them and to prepare KS2 children for their secondary education.

Our lessons will be carefully planned and delivered to allow our pupils to work scientifically by: encouraging them to be inquisitive, opportunities to plan, observe, measure, gather and record data, present findings and come to conclusions.

Lessons are to follow the guidance and be supported by the White Rose SOL.

Year ¾						
Cycle Two						
	Autumn 1	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**	**Summer 2**

Topic	Food chains (2) Group and classify living things (3) Data collection A (1)	The Digestive System (5)		Sounds (5) Investigation & Consolidation (1)	States of Matter (7)	Electricity (4) Energy (1)
Cross Curricular Links			Learning Outside the Classroom			
Knowledge Pupils will …	• Recognise that living things can be grouped in a variety of ways. • Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. • Recognise that	• Describe the simple functions of the basic parts of the digestive system in humans.		• Identify how sounds are made, associating some of them with something vibrating. • Recognise that vibrations from sounds travel through a medium to the ear • Find patterns between the pitch of a sound and features of the object that produced it.	• Compare and group materials together, according to whether they are solids, liquids or gases. • Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius	• Identify common appliances that run on electricity. • Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. • Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a

	environments can change and that this can sometimes pose dangers to living things. •Collect and present data in a range of formats. Including tables and graphs.			• Find patterns between the volume of a sound and the strength of the vibrations that produced it. • Recognise that sounds get fainter as the distance from the sound source increases.	(°C). • Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	complete loop with a battery. • Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. • Recognise some common conductors and insulators, and associate metals with being good conductors.
Skills Pupils will …	BSquared Step 7 (Age 7-9) **Biology – Plants** •Predicts how different conditions may affect seed growth. •Explores the requirements for	BSquared Step 7 (Age 7-9) **Biology – Animals, including Humans** •Recognises how they change through the human life cycle and that change is ongoing.		BSquared Step 7 (Age 7-9) **Physics – Sound** •Recognises that sound can travel through air, walls, windows, etc. •Recognises that sound travels to	BSquared Step 7 (Age 7-9) **Chemistry – States of Matter** •Measures or researches to find out the temperature materials change shape.	BSquared Step 7 (Age 7-9) **Physics – Electricity** •Explains the function of a switch in a circuit. •Describes the difference between an electrical

	life and growth for different types of plants. •Explains simply why seeds need to be dispersed. •Looks for patterns in colours or textures of flowers when discussing how the seeds are dispersed. •Classifies plants into broad groups using observable features, •Names, locates and describes the main parts of a plant involved in transporting water and nutrients. •Relates the terms "pollen" and	•Identifies physical differences between females and males. •Names and labels the organs which are protected by different parts of the skeleton, e.g. ribs. •Identifies, names and labels the different teeth in humans and their functions, e.g. canine, incisor Simply describes the process of food digestion using given vocabulary. •Understands the simple functions of the basic parts of the human digestive system,		the ears from its source. •Describes the difference in vibrations made when a loud or soft noise is heard. •Recognises that sound travels to our ears. •Uses the idea that sounds are associated with vibrations, and that they require a medium to travel through, to explain how sounds are made and heard. •Describes the relationship between the pitch of a sound and the features of its source; and between the	•Describes how some common materials can change state. •Explores different objects to test if they are solid, liquid or gas. •Classes changes to water as a reversible change. •Explains the different stages of the water cycle. •Describes how water can keep on changing between states. •Describes the characteristics of different states of matter and groups materials on this basis; and	conductor and insulator, giving examples. •Identifies what makes a complete electrical circuit. •Checks components in the circuits one-by-one to find a problem. •Recognises a circuit must have a power source, which is part of a complete loop, to work. •Draws their circuit using pictorial representation.

	"pollination" to plant life cycles. •Relates the term "photosynthesis" to plant nutrients and growth. •Describes and labels a flowering plant, giving an explanation of the functions of the main parts, e.g. flower, leaves, root. •Observes and makes detailed drawings of parts of a flower, labelling different parts. **Biology – Living Things and their Habitats** •Describes the requirements of	e.g. saliva, small intestine. •Names and describes the functions of the main parts of the digestive system.		volume of a sound, the strength of the vibrations and the distance from its source.	describes how materials change state at different temperatures, using this to explain everyday phenomena, including the water cycle.	

	plants for life and growth. •Explains how environmental changes may have an impact on living things. •Suggests why all living things are closely dependent on their environment. •Describes life cycles in some plants and animals simply, including reproduction. •Identifies the main stages of the human life cycle. •Raises and answers questions about local living things and their habitats, e.g. by					

	exploring their local environment at different stages throughout the school year. •Explores the dependency between animals and habitats and predicts what might happen if something changes. •Creates a simple classification key to name, identify and group living things. •Names, identifies and groups a variety of living things using classification keys. •Groups living things in a variety of different ways.					

Skills- Working Scientifically **Pupils will…**	**Working Scientifically** (BSquared Step 7 Age 7-9) •Includes scientific language appropriate to the topic correctly when communicating their ideas and findings. •Draws simple conclusions based on their findings. •Compares scientific information from different sources. •Collates and organises scientific information. •Discusses information gathered on a data logger. •Interprets and presents discrete and continuous data using appropriate graphical methods, including bar charts and time graphs. •Creates graphs and charts to record information they have gathered. •Takes careful measurements using standard units. •Records information they have found through research. •Extracts and combines information from more than one given source. •Classifies using a range of simple methods, e.g. Venn diagram, lists. •Observes closely using a magnifying glass or microscope to help give a detailed view or answer to a scientific question. •Predicts using prior knowledge, e.g. what might happen to a heated material. •Identifies how to control the variables in a simple test.

	•Suggests a variable that could be tested, e.g. to find the best growing conditions for a seed. •Plans a practical enquiry to test their idea after discussion with a member of staff. •Makes notes of ideas, theories and questions they have.					
Key vocabulary	• Vertebrate – an animal with a spine. • Invertebrate – an animal without a spine. • Exoskeleton – a type of skeleton on the outside of an animal's body that provides support and protection. • Insect – an invertebrate that has three body sections, six legs and two antennae.	• Teeth – the hard structures in the mouth used to bite and chew through food. • Carnivore – an animal that eats other animals. • Herbivore – an animal that eats plants • omnivore – an animal that eats other animals and plants. • Teeth – the hard structures in the mouth used to bite and chew through food.		• Vibration – a quick back-and-forth movement. • Ear – an organ in humans (and many other animals) that detects vibrations, allowing hearing. • Sound – vibrations that travel through the air, or another medium, and are heard when they reach an ear. • Volume – how loud or quiet a sound is.	• Solid – a state of matter with a fixed shape and a fixed volume. • Liquid – a state of matter with no fixed shape but a fixed volume. • Gas – a state of matter with no fixed shape and no fixed volume. • Volume – the amount of space a solid, liquid or a gas takes up. • States of Matter – the different forms that	• Appliances – electrical devices used for a particular purpose, e.g. fridge, oven. • Plug – a device put into a socket to connect to an electrical circuit. • Socket – the part of the electrical circuit where the plug fits to make a connection. • Cell – a portable store of energy. • Electrocuted – to be injured or killed by electricity.

	• Spider – an invertebrate that has two body sections and eight legs. • Soft-bodied invertebrate – an invertebrate with a soft body such as a slug or a snail. •Mammal – an animal with a spine, fur or hair on its body, and feeds its young on milk • Bird – an animal with a spine, feathers, wings and a beak. • Fish – an animal with a spine, fins and gills, that lives in water. • Amphibian – an animal with a spine	• Incisors – flat teeth at the front of the mouth that are used to bite into food. • Canines – sharp, pointed teeth that help with ripping and tearing. • Premolars – the teeth found between canine teeth and molars that guide food to the back of the mouth. • Molars – the large teeth at the very back of the mouth used to grind and chew food. •Enamel – the protective layer of a tooth.		• Pitch – how high or low a sound is. •Ear canal – the tube that runs from the outer ear to the ear drum ear. •Ear bones – tiny bones that transfer vibrations from the ear drum to the inner ear. •Ear drum – a thin layer that can vibrate. •Cochlea – a spiral-shaped tube in the inner ear. •Decibel (dB) – a measure of the loudness of a sound. • Decibel meter – a piece of	materials can take. •Pouring solid – a solid that can be poured like a liquid. • Volume – the amount of space a solid, liquid or gas takes up. • Flow – to move smoothly and continuously in one direction. • Freezing – the change of state from a liquid to a solid. • Melting – the change of state from a solid to a liquid. • Boiling – the change of state	• Circuit – a closed path that energy can flow through. • Switch – a device that opens and closes an electrical circuit. •battery – two or more cells joined together to store more energy. • Buzzer – a device that makes a sound. • Conductor – a material that allows energy to flow through it. • Insulator – a material that does not allow energy to flow through it. • Metal – a material which can be hard,

	that can live on land and in water • Reptile – an animal with a spine and dry scales on its body. • Flowering plant – a plant that can produce flowers and fruit. • Pollination – the transfer of pollen from the male parts to the female parts. • Non-flowering plant – a plant that does not produce flowers or fruit. • Fern – a non-flowering plant with long stems and feather-like leaves.	• Root – the part of a tooth that holds it in place in the jaw. • Plaque − a sticky coating made by germs that can harm the teeth and gums. • Oesophagus – the organ that pushes food from the mouth to the stomach intestines (small and large) – the organs that absorb nutrients and water from food. •Mouth – the organ that takes in food and begins digestion using teeth and saliva. •Stomach – the organ that squeezes and		equipment used to measure the loudness of sound. •Insulate – to protect something from the transfer of heat, sound or electricity.	from a liquid to a gas, which happens quickly when heated and creates bubbles of the gas. • Condensation – the change of state from a gas to a liquid. • Evaporation – the change of state from a liquid to a solid, which happens slowly from the surface of the liquid. • Independent variable (what will change) – the temperature of the different locations. • Dependent variable (what will be measured) – the time it takes for	shiny and a conductor of electricity. • Material – what an object is made from. • Electricity – energy that flows in wires. • Mains electricity – energy flowing to homes, businesses and schools through wires. • Battery-powered – a device that needs cells to work. • Renewable energy – energy sources that do not run out such as wind and solar (Sun) energy. • Non-renewable energy – energy sources that can run out.

	• Moss – a non-flowering plant that grows in damp, moist conditions. • Flowering plant – a plant that can produce flowers and fruit. • Non-flowering plant – a plant that does not produce flowers and fruit. • Stamen – the male parts of a flowering plant. • Pistil – the female part of a flowering plant.	breaks down food. •Rectum – part of the large intestine where waste exits the body. • Saliva – clear liquid in the mouth that softens food.			the water to evaporate. • Controlled variables (what is kept the same) – the volume of water in the containers, the size of the containers, the initial temperature of the water in all the containers.	
Extra-curricular opportunities	Chester Zoo	TBC	TBC	Eureka Science Museum Imagine That		
Year 5/6						

Cycle Two •						
	Autumn 1	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**	**Summer 2**
Topic	Variation (2) Adaptations (4)	Light (5) Light pollution (1)	Electricity (5) Renewable energy (1)	The Circulatory System (5)		Themed Projects
Cross Curricular Links					Learning Outside the Classroom	
Knowledge Pupils will …	• Recognise that living things produce offspring of the same kind, but normally offspring vary and are not Identical to their parents. • Identify how animals and plants are adapted to suit	• Recognise that light travels in straight lines. • Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye. • Explain that we see things because light travels from light sources to our	• Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. • Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of	• Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. • Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. • Describe the		The Year 7 Ready projects have been designed to be completed in the summer term of Year 6, following the end-of-year assessments and the completion of the White Rose Primary Science schemes of learning. They are non-statutory. The projects:

	their environment in different ways and that adaptation may lead to evolution.	eyes or from light sources to objects and then to our eyes. • Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.	switches. • Use recognised symbols when representing a simple circuit in a Diagram.	ways in which nutrients and water are transported within animals, including humans.		1) Melting Points 2) Thermal Insulation • Provide an opportunity to revisit many of the skills and curriculum content covered throughout primary science. • Cover some of the key disciplinary knowledge that secondary school science teachers would expect children to be familiar with. • Revisit chemistry content, as chemistry topics are not included in the Year 6 National Curriculum. Both projects look at

						the problem of how to stop a chocolate bar from melting on a hot day. The first project focuses on what could be changed about the chocolate itself, and the second focuses on the wrapper. They can be completed independent of each other or in any order.
Skills Pupils will …	BSquared Step 8 (Age 9-11) **Biology – Evolution & Inheritance** •Uses the basic ideas of inheritance, variation and adaptation to describe how living things have changed over time	BSquared Step 8 (Age 9-11) **Physics – Light** •Makes comparative statements about the brightness of a shadow. •Lists some materials which	BSquared Step 8 (Age 9-11) **Physics – Electricity** •Explains that their series circuit will pass through all components one after the other. •Describes the effect of changing components within	BSquared Step 8 (Age 9-11) **Biology – Animals, including Humans** •Describes the effects of diet, exercise, drugs and lifestyle on how the body functions. •Describes the function of the		These projects will be carried out after the end of KS2 assessments and data have been completed.

	and evolved; and provides evidence for evolution. •Recognises that it takes many generations to develop adaptation. •Recognises that evolution is a result of adaptation. •Identifies how different living things have adapted to their environment. •Recognises that fossils are a record of evolution. •Recognises that offspring are not identical to their parents and can give examples to back up their view.	reflect light into the eyes. •Explains the movement of light and the reflection of light in a periscope. •Describes the difference in the size of a pupil in different amounts of light. •Uses the idea that light from light sources, or reflected light, travels in straight lines and enters our eyes to explain the formation and size of shadows.	a circuit. •Uses simple apparatus to construct and control a series circuit, and describes how the circuit may be affected when changes are made to it; and uses recognised symbols to represent simple series circuit diagrams. •Explains why a circuit does not work by looking at the circuit diagram.	blood, blood vessels and heart. •Names and describes the functions of the main parts of the circulatory system.		

	•Describes a change over time as a variation or adaptation. •Suggest why an animal has evolved a certain feature, e.g. giraffe's neck. •Suggests reasons why a living thing became extinct, e.g. mammoth.					
	Working Scientifically (BSquared Step 8 Age 9-11) •Describes and evaluates their own and other people's scientific ideas related to topics in the national curriculum (including ideas that have changed over time) using evidence from a range of sources. •Asks their own questions about the scientific phenomena they are studying, and selects and plans the most appropriate ways to answer these questions, recognising and controlling variables where necessary, e.g. observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests, and finding things out using a wide range of secondary sources of information. •Records data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. •Raises further questions that could be investigated, based on their data and observations using appropriate scientific language					

	from the national curriculum. •Reports their findings, relating data to their conclusions. •Predicts what might happen if a variable was changed using their findings, e.g. if they add another component to their circuit. •Draws conclusions, explains and evaluates their methods and findings using appropriate scientific language from the national curriculum. •Uses a range of scientific equipment to take accurate and precise measurements or readings, with repeat readings where appropriate. •Records observations in a variety of ways. •Creates a simple classification key, e.g. using leaves from their environment.					
Key vocabulary	• Organism – a living thing such as an animal, plant, bacterium or fungus. • Variation – differences between organisms. • Species – similar organisms where	•Pupil – the black part of the eye that lets light into the eye. •Lens – the part of the eye that focuses light onto the retina. •Retina – the layer at the back of the eye that is sensitive to light.	• Series circuit – a circuit where all the components are connected in one single loop. • Cell – a portable store of energy • Battery – two or more cells joined together to store more energy. • Bulb – a	• Circulatory system – parts of the body that work together to move blood around the body. •Heart – the organ responsible for pumping blood around the body. • Blood vessels – tubes within the		

	two parents can create Offspring. • Offspring – the young of a living thing. • Characteristic – a feature of an organism, used to identify individuals or a group. • Inheritance – the passing on of characteristics from parent to offspring. • Desirable characteristics – features of organisms that we Prefer.	•Iris – the coloured part of the eye that controls the size of the pupil. •Light source – object that produces light. • Reflection – when light bounces off an object. • Ray diagram – a diagram that shows how light travels. • Angle – where two lines meet at a point. • Periscope – an instrument that uses mirrors to make objects visible around barriers. • Shadow – a dark	component that produces light. • Current – the flow of electricity in a circuit. • Voltage – causes the current to flow Complete. • Circuit – a circuit that does not have a break in it. • Incomplete circuit – a circuit that has a break in it. • Switch – a component that allows a current in a circuit to be turned on and off. • Buzzer – a component that makes a buzzing or beeping sound. • Independent	body that carry. • Blood veins – blood vessels that carry blood towards the heart. • Capillaries – blood vessels that connect veins and arteries. • Arteries – blood vessels that carry blood away from the heart. • Red blood cells – part of the blood that carries oxygen and removes waste products. • White blood cells – part of the blood that fights viruses and bacteria. • Lungs – organs that exchange		

		area caused by an object blocking a source of light. • Opaque – an object or material that does not allow any light to pass through it. • Translucent – an object or material that allows some light to pass through it. • Transparent – an object or material that allows all light to pass through it. • Solar eclipse – when the Moon passes between the Earth and the Sun and blocks the sunlight from reaching the Earth. This casts a shadow of the Moon on the	variable (what will change) – the voltage, or the number of cells. • Dependent variable (what will be measured) – the loudness of the buzzers. • Controlled variables (what is kept the same) – the type of cells used and the number of components in the circuit.	gases during breathing. • Nutrients – substances that provide the important nourishment we need for our bodies to grow and repair themselves. • Plasma – part of the blood that carries nutrients. • Oxygen – a gas in the air we breathe that all cells in our body need to survive. • Atria – the top two chambers in the heart. • Ventricles – the bottom two chambers in the		

		Earth. • Independent variable (what will change) – the distance between the light source and the opaque object. • Dependent variable (what will be measured) – the size of the shadow on the wall. • Controlled variable (what is kept the same) – the size of the opaque object and the distance from the object to the wall. • Conclusion – what has been found out during an investigation		heart. • Oxygenated blood – blood that is carrying lots of oxygen. • Deoxygenated blood – blood that is carrying little oxygen.		

		based on experimental measurements and observations. • Evaluate – to consider the quality of the results obtained and suggest improvements to the investigation.				
Extra-curricular opportunities	Animal/Farm Show	Eureka Science Museum	New Brighton Wind Farm Local walk to find renewable energy in Leasowe	TBC		