Medium Term Curriculum Planning Lower Key Stage 2

NON-NEGOTIABLES	THINGS TO CONSIDER:
Subject assessment criteria; Knowledge organiser; Vocabulary organiser	Offsite visit; Parental involvement; Take Home Tasks (tats)

Key stage 2 Years 3/4 Working scientifically. All Science topics should include:

- Asking relevant questions and using different types of science enquiries to answer them
- Setting up simple practical enquiries, comparative and fair tests
- Making systematic and careful and where appropriate using standard units, a range of equipment, including thermometers and data loggers
- Gathering, recording, classifying and presenting data in a variety of ways in order to help answer questions
- Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables
- Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- Identifying differences, similarities or changes related to simple scientific ideas and processes
- Using straightforward scientific evidence to answer questions or to support their findings

Year 3

Year 3: Autumn term Plants	**Plants** • N.C. 3.1: identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers • N.C. 3.2: explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant • N.C. 3.3: investigate the way in which water is transported within plants • N.C. 3.4: explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal

	• N.C. 3.5: Applying knowledge in familiar related contexts, including a range of enquiries Applying knowledge in familiar related contexts, including a range of enquiries	
	Assessment guidance: Shows understanding of a concept using scientific vocabulary correctly	
	Key learning: Many plants, but not all, have roots, stems/trunks, leaves and flowers/blossom. The roots absorb water and nutrients from the soil and anchor the plant in place. The stem transports water and nutrients/minerals around the plant and holds the leaves and flowers up in the air to enhance photosynthesis, pollination and seed dispersal. The leaves use sunlight and water to produce the plant's food. Some plants produce flowers which enable the plant to reproduce. Pollen, which is produced by the male part of the flower, is transferred to the female part of other flowers (pollination). This forms seeds, sometimes contained in berries or fruits which are then dispersed in different ways. Different plants require different conditions for germination and growth.	**Possible Evidence:** Can explain the function of the parts of a flowering plant Can describe the life cycle of flowering plants, including pollination, seed formation, seed dispersal, and germination Can give different methods of pollination and seed dispersal, including examples
	Key vocabulary: Evaporation, pollination, fertilisation, stamen, carpel, sepal, anther, anchor, wind dispersal, animal dispersal.	
	Cornerstones Investigations for this area of study. Use the TASC wheel for these investigations. **Why are trees tall?** (N.C. 3.3) **What are flowers for?** (N.C.3.1)	
	Assessment guidance: Applying knowledge in familiar related contexts, including a range of enquiries	
	Key learning: Observe what happens to plants over time when the leaves or roots are removed Observe the effect of putting cut white carnations or celery in coloured water Investigate what happens to plants when they are put in different conditions e.g. in darkness, in the cold, deprived of air, different types of soil, different fertilisers, varying amount of space Spot flowers, seeds, berries and fruits outside throughout the year Observe flowers carefully to identify the pollen	**Possible Evidence:** Can explain observations made during investigations Can look at the features of seeds to decide on their method of dispersal Can draw and label a diagram of their created flowering plant to show its parts, their role and the method of pollination and seed dispersal

	Observe flowers being visited by pollinators e.g. bees and butterflies in the summer Observe seeds being blown from the trees e.g. sycamore seeds Research different types of seed dispersal Classify seeds in a range of ways including by how they are dispersed Create a new species of flowering plant	
Year 3: Spring term 1 Animals including humans	**<u>Animals including humans</u>** • N.C.3.5: identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat • N.C. 3.6: identify that humans and some other animals have skeletons and muscles for support, protection and movement	
	Assessment guidance: Shows understanding of a concept using scientific vocabulary correctly	
	Key learning: Animals, unlike plants which can make their own food, need to eat in order to get the nutrients they need. Food contains a range of different nutrients that are needed by the body to stay healthy – carbohydrates including sugars, protein, vitamins, minerals, fibre, fat, sugars, water. A piece of food will often provide a range of nutrients. Humans and some other animals have skeletons and muscles which help them move and provide protection and support	**Possible Evidence:** Can name the nutrients found in food Can state that to be healthy we need to eat the right types of food to give us the correct amount of these nutrients Can name some bones that make up their skeleton giving examples that support, help them move or provide protection Can describe how muscles and joints help them to move
	Key vocabulary: Nutrients, fats (saturated and unsaturated), muscles, joints, tendons, vertebrate, invertebrate, energy, vitamins, minerals.	
	Cornerstones Investigations for this area of study. Use the TASC wheel for these investigations. **What do owls eat?** (N.C.3.5)	
	Assessment guidance: Applying knowledge in familiar related contexts, including a range of enquiries	
	Key learning: Classify food in a range of ways Use food labels to explore the nutritional content of a range of food items Use secondary sources to find out they types of food that contain the different nutrients	**Possible Evidence:** Can classify food into those that are high or low in particular nutrients Can answer their questions about nutrients in food based on their gathered evidence Can talk about the nutrient content of their daily plan

	Use food labels to answer enquiry questions e.g. How much fat do different types of pizza contain? How much sugar is in soft drinks? Plan a daily diet contain a good balance of nutrients Explore the nutrients contained in fast food Use secondary sources to research the parts and functions of the skeleton Investigate pattern seeking questions such as • Can people with longer legs run faster? • Can people with bigger hands catch a ball better? Compare, contrast and classify skeletons of different animals	Use their data to look for patterns (or lack of) when answering their enquiry question Can give similarities e.g. they all have joints to help the animal move, and differences between skeletons
Year 3: Spring term 2 Rocks	**<u>Rocks</u>** • N.C. 3.7: compare and group together different kinds of rocks on the basis of their appearance and simple physical properties • N.C. 3.8: describe in simple terms how fossils are formed when things that have lived are trapped within rock • N.C. 3.9 recognise that soils are made from rocks and organic matter	
	Assessment guidance: Shows understanding of a concept using scientific vocabulary correctly	
	Key Learning: Rock is a naturally occurring material. There are different types of rock e.g. sandstone, limestone, slate etc. which have different properties. Rocks can be hard or soft. They have different sizes of grain or crystal. They may absorb water. Rocks can be different shapes and sizes (stones, pebbles, boulders). Soils are made up of pieces of ground down rock which may be mixed with plant and animal material (organic matter). The type of rock, size of rock piece and the amount of organic matter affect the property of the soil. Some rocks contain fossils. Fossils were formed millions of years ago. When plants and animals died, they fell to the seabed. They became covered and	**Possible evidence:** Can name some types of rock and give physical features of each Can explain how a fossil is formed Can explain that soils are made from rocks and also contain living/dead matter

	squashed by other material. Over time the dissolving animal and plant matter is replaced by minerals from the water.	
	Key vocabulary: Sedimentary rock, igneous rock, metamorphic rock, permeable, fossilisation, palaeontologist, layers, soil, granite, erosion.	
	Cornerstones Investigations for this area of study. Use the TASC wheel for these investigations. **What is soil?** (N.C: 3.7)	
	Assessment guidance: Applying knowledge in familiar related contexts, including a range of enquiries	
	Key Learning: Observe rocks closely Classify rocks in a range of ways based on their appearance Devise a test to investigate the hardness of a range of rocks Devise a test to investigate how much water different rocks absorb Observe how rocks change over time e.g. gravestones or old building Research using secondary sources how fossils are formed Observe soils closely Classify soils in a range of ways based on their appearance Devise a test to investigate the water retention of soils Observe how soil can be separated through sedimentation Research the work of Mary Anning	**Possible evidence:** Can classify rocks in a range of different ways using appropriate vocabulary Can devise tests to explore the properties of rocks and use data to rank the rocks Can link rocks changing over time with their properties e.g. soft rocks get worn away more easily Can present in different ways their understanding of how fossils are formed e.g. in role play, comic strip, chronological report, stop-go animation etc. Can identify plant/animal matter and rocks in samples of soil Can devise a test to explore the water retention of soils
Year	**Light**	

	• N.C. 3.10: recognise that they need light in order to see things and that dark is the absence of light • N.C. 3.11: notice that light is reflected from surfaces • N.C. 3.12: recognise that light from the sun can be dangerous and that there are ways to protect their eyes • N.C. 3.13: recognise that shadows are formed when the light from a light source is blocked by an opaque object • N.C. 3.14: find patterns in the way that the size of shadows change	
	Assessment guidance: Shows understanding of a concept using scientific vocabulary correctly	
	Key Learning: We see objects because our eyes can sense light. Dark is the absence of light. We cannot see anything in complete darkness. Some objects, for example the sun, light bulbs and candles are sources of light. Objects are easier to see if there is more light. Some surfaces reflect light. Objects are easier to see when there is less light if they are reflective. The light from the sun can damage our eyes and therefore we should not look directly at the Sun and can protect our eyes by wearing sunglasses or sunhats in bright light. Shadows are formed on a surface when an opaque or translucent object is between a light source and the surface and blocks some of the light. The size of the shadow depends on the position of the source, object and surface.	**Possible evidence:** Can describe how we see objects in light and can describe dark as the absence of light Can state that it is dangerous to view the sun directly and state precautions used to view the sun, for example in eclipses Can define transparent, translucent and opaque Can describe how shadows are formed by objects blocking light.
	Key vocabulary: Light source, shadow, translucent, reflection, ray, light energy, illuminate, beam, glare, UV light	
	Cornerstones Investigations for this area of study. Use the TASC wheel for these investigations. **Why do shadows change?** (N.C. 3:12)	
	Assessment guidance: Applying knowledge in familiar related contexts, including a range of enquiries.	
	Key Learning: Explore how different objects are more or less visible in different levels of lighting Explore how objects with different surfaces e.g. shiny vs matt are more or less visible Explore how shadows vary as the distance between a light source, an object or surface is changed	**Possible evidence:** Can describe patterns in visibility of different objects in different lighting conditions and predict which will be more or less visible as conditions change Can clearly explain, giving examples, that objects are not visible in complete darkness Can describe and demonstrate how shadows are formed by blocking light

	Explore shadows which are connected to and disconnected from the object e.g. shadows of clouds and children in the playground Choose suitable materials to make shadow puppets Create artwork using shadows	Can describe, demonstrate and make predictions about patterns in how shadows vary
Year 3: Summer term 2 Forces and magnets	**<u>Forces and magnets</u>** • N.C. 3.15: compare how things move on different surfaces • N.C. 3.16: notice that some forces need contact between two objects, but magnetic forces can act at a distance • N.C. 3.17: observe how magnets attract or repel each other and attract some materials and not others • N.C. 3.18: compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials • N.C. 3.19: describe magnets as having two poles • N.C. 3.20: predict whether two magnets will attract or repel each other, depending on which poles are facing	
	Assessment guidance: Shows understanding of a concept using scientific vocabulary correctly	
	Key Learning: A force is a push or a pull. When an object moves on a surface, the texture of the surface and the object affect how it moves. It may help the object to move better or it may hinder its movement e.g. ice skater compared to walking on ice in normal shoes. A magnet attracts magnetic material. Iron and nickel and other materials containing these e.g. stainless steel, are magnetic. The strongest parts of a magnet are the poles. Magnets have two poles – a north pole and a south pole. If two like poles e.g. two north poles, are brought together they will	**Possible evidence:** Can give examples of forces in everyday life Can give examples of objects moving differently on different surfaces Can name a range of types of magnets and show how the poles attract and repel Can draw diagrams using arrows to show the attraction and repulsion between the poles of magnets

	push away from each other – repel. If two unlike poles e.g. a north and south, are brought together they will pull together – attract. For some forces to act there must be contact e.g. a hand opening a door, the wind pushing the trees. Some forces can act at a distance e.g. magnetism. The magnet does not need to touch the object that it attracts. Force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole	
	Key vocabulary: Surface, forces, magnetic fields, magnetic poles, attract, repel, iron filings, compass, metals, friction	
	Cornerstones Investigations for this area of study. Use the TASC wheel for these investigations. **Can you block magnetism?** (N.C 3:17)	
	Assessment guidance: Applying knowledge in familiar related contexts, including a range of enquiries	
	Key Learning: Carry out investigations to explore how objects move on different surfaces e.g. spinning tops/coins, rolling balls/cars, clockwork toys, soles of shoes etc. Explore what materials are attracted to a magnet Classify materials according to whether they are magnetic Explore the way that magnets behave in relation to each other Use a marked magnet to find the unmarked poles on other types of magnets Explore how magnets work at a distance e.g. through the table, in water, jumping paper clip up off the table Devise an investigation to test the strength of magnets	**Possible evidence:** Can use their results to describe how objects move on different surfaces Can use their results to make predictions for further tests e.g. it will spin for longer on this surface than that, but not as long as it spun on that surface Can use classification evidence to identify that some metals but not all are magnetic Through their exploration they can show how like poles repel and unlike poles attract and name unmarked poles Can use test data to rank magnets
Year 4		
Year 4: Autumn	**<u>Living things and their habitats</u>** • N.C. 4.1: recognise that living things can be grouped in a variety of ways	

	• N.C. 4.2: explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment • N.C. 4.3: recognise that environments can change and that this can sometimes pose dangers to living things	
	Assessment guidance: Shows understanding of a concept using scientific vocabulary correctly	
	Key Learning: Living things can be grouped (classified) in different ways according to their features. Classification keys can be used to identify and name living things. Living things live in a habitat which provides an environment to which they are suited (year 2 learning). These environments may change naturally e.g. through flooding, fire, earthquakes etc. Humans also cause the environment to change. This can be in a good way i.e. positive human impact, such as setting up nature reserves or in a bad way i.e. negative human impact, such as littering. These environments also change with the seasons; different living things can be found in a habitat at different times of the year Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate	**Possible evidence:** Can name living things living in a range of habitats, giving the key features that helped them to identify them Can give examples of how an environment may change both naturally and due to human impact
	Key vocabulary: Organisms, specimen, classification, characteristics, environment, endangered species, extinct, classification key, environmental dangers, urbanisation.	
	Cornerstones Investigations for this area of study. Use the TASC wheel for these investigations. **Are all sea creatures the same?** (N.C 4.1;4.2)	
	Assessment guidance: Applying knowledge in familiar related contexts, including a range of enquiries	
	Key Learning: Observe plants and animals in different habitats throughout the year Compare and contrast the living things observed Use classification keys to name unknown living things Classify living things found in different habitats based on their features Create a simple identification key based on observable features Use fieldwork to explore human impact on the local environment e.g. litter, tree planting	**Possible evidence:** Can keep a careful record of living things found in different habitats throughout the year (diagrams, tally charts etc.) Can use classification keys to identify unknown plants and animals Can present their learning about changes to the environment in different ways e.g. campaign video, persuasive letter

	Use secondary sources to find out about how environments may naturally change Use secondary sources to find out about human impact, both positive and negative, on environments	
Year 4: Autumn term 2 Animals including humans	**<u>Animals including humans</u>** • N.C. 4.4: describe the simple functions of the basic parts of the digestive system in humans • N.C. 4.5: identify the different types of teeth in humans and their simple functions • N.C. 4.6: construct and interpret a variety of food chains, identifying producers, predators and prey	
	Assessment guidance: Shows understanding of a concept using scientific vocabulary correctly	
	Key Learning: Food enters the body through the mouth. Digestion starts when the teeth start to break the food down. Saliva is added and the tongue rolls the food into a ball. The food is swallowed and passes down the oesophagus to the stomach. Here the food is broken down further by being churned around and other chemicals are added. The food passes into the small intestine. Here nutrients are removed from the food and leave the digestive system to be used elsewhere in the body. The rest of the food then passes into the large intestine. Here the water is removed for use elsewhere in the body. What is left is then stored in the rectum until it leaves the body through the anus when you go to the toilet. Humans have four types of teeth - incisors for cutting, canines for tearing, molars and premolars for grinding (chewing). Living things can be classified as producers, predators and prey according to their place in the food chain.	**Possible evidence:** Can sequence the main parts of the digestive system Can draw the main parts of the digestive system onto a human outline Can describe what happens in each part of the digestive system Can point to the three different types of teeth in their mouth and talk about their shape and what they are used for Can name producers, predators and prey within a habitat Can construct food chains
	Key vocabulary: Digestive system, stomach, producer, prey, predator, enamel, saliva, food chain, incisor, canine, molar.	
	Cornerstones Investigations for this area of study. Use the TASC wheel for these investigations. **What is spit for?** (N.C. 4.4)	
	Assessment guidance: Applying knowledge in familiar related contexts, including a range of enquiries	
	Key Learning: Research the function of the parts of the digestive system Create a model of the digestive system using household objects	**Possible evidence:** Can use diagrams or a model to describe the journey of food through the body explaining what happens in each part.

	Explore eating different types of food, to identify which teeth are being used for cutting, tearing and grinding (chewing) Classify animals as herbivores, carnivores or omnivores according to the type of teeth they have in their skulls Use food chains to identify producers, predators and prey within a habitat Use secondary sources to identify animals in a habitat and find out what they eat	Can record the teeth in their mouth (make a dental record) Can explain the role of the different types of teeth Can explain how the teeth in animal skulls show they are carnivores, herbivores or omnivores. Can create food chains based on research
Year 4: Spring term States of Matter	**<u>States of Matter</u>** • N.C. 4.7: compare and group materials together, according to whether they are solids, liquids or gases • N.C. 4.8: 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 (°C) • N.C. 4.9: identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature	
	Assessment guidance: Shows understanding of a concept using scientific vocabulary correctly	
	Key Learning: A solid keeps its shape and has a fixed volume. A liquid has a fixed volume but changes in shape to fit the container. A liquid can be poured and keeps a level, horizontal surface. A gas fills all available space; it has no fixed shape or volume. Granular and powdery solids like sand can be confused with liquids because they can be poured, but when poured they form a heap and they do not keep a level surface when tipped. Each individual grain demonstrates the properties of a solid. Melting is a state change from solid to liquid. Freezing is a state change from liquid to solid. The freezing point of water is $0^{o}C$. Boiling is a change of state from liquid to gas that happens when a liquid is heated to a specific temperature and bubbles of the gas can be seen in the liquid. Water boils when it is heated to $100^{o}C$. Evaporation is the same state change as boiling (liquid to gas) but it happens slowly at lower temperatures and only at the surface of the liquid. Evaporation happens more quickly if the temperature is higher, the liquid is spread out or it is	**Possible evidence:** Can create a concept map, including arrows linking the key vocabulary Can name properties of solids, liquids and gases Can give everyday examples of melting and freezing Can give everyday examples of evaporation and condensation Can describe the water cycle

	windy. Condensation is the change back from a gas to a liquid caused by cooling. Water at the surface of seas, rivers etc. evaporates into water vapour (a gas). This rises, cools and condenses back into a liquid forming clouds. When too much water has condensed the water droplets in the cloud get too heavy and fall back down as rain, snow, sleet etc. and drain back into rivers etc. This is known as precipitation. This is the water cycle.	
	Key vocabulary: Solid, liquid, gas, states of Matter, evaporate, condensate, water vapour, precipitation, melting point, freezing point.	
	Cornerstones Investigations for this area of study. Use the TASC wheel for these investigations. **Is custard a liquid?** (N.C. 4.7) **Where does water go?** (N.C. 4.9)	
	Assessment guidance: Applying knowledge in familiar related contexts, including a range of enquiries	
	Key Learning: Observe closely and classify a range of solids Observe closely and classify a range of liquids Explore making gases visible e.g. squeezing sponges under water to see bubbles, and showing their effect e.g. using straws to blow objects, trees moving in the wind Classify materials according to whether they are solids, liquids and gases Observe a range of materials melting e.g. ice, chocolate, butter Investigate how to melt ice more quickly Observe the changes when making rocky road cakes or ice-cream Investigating melting point of different materials e.g. ice, margarine, butter and chocolate Explore freezing different liquids e.g. tomato ketchup, oil, shampoo Use a thermometer to measure temperatures e.g. icy water (melting), tap water, hot water, boiling water (demonstration) Observe water evaporating and condensing e.g. on cups of icy water and hot water Set up investigations to explore changing the rate of evaporation e.g. washing, puddles, handprints on paper towels, liquids in containers Use secondary sources to find out about the water cycle	**Possible evidence:** Can give reasons to justify why something is a solid liquid or gas Can give examples of things that melt/freeze and how their melting points vary From their observations, can give the melting points of some materials Using their data, can explain what affects how quickly a solid melts Can measure temperatures using a thermometer Can explain why there is condensation on the inside the hot water cup but on the outside of the icy water cup From their data, can explain how to speed up or slow down evaporation Can present their learning about the water cycle in a range of ways e.g. diagrams, explanation text, story of a water droplet

Year 4: Summer term 1 **Sound**	**Sound** • N.C. 4.10: identify how sounds are made, associating some of them with something vibrating • N.C. 4.11: recognise that vibrations from sounds travel through a medium to the ear • N.C. 4.12: find patterns between the pitch of a sound and features of the object that produced it • N.C. 4.13: find patterns between the volume of a sound and the strength of the vibrations that produced it • N.C. 4.14: recognise that sounds get fainter as the distance from the sound source increases	
	Assessment guidance: Shows understanding of a concept using scientific vocabulary correctly	
	Key Learning: A sound source produces vibrations which travel through a medium from the source to our ears. Different mediums such as solids, liquids and gases can carry sound but sound cannot travel through a vacuum (an area empty of matter). The vibrations cause parts of our body inside our ears to vibrate, allowing us to hear (sense) the sound. The loudness (volume) of the sound depends on the strength (size) of vibrations which decreases as they travel through the medium. Therefore, sounds decrease in volume as you move away from the source. A sound insulator is a material which blocks sound effectively. Pitch is the highness or lowness of a sound and is affected by features of objects producing the sounds. For example, smaller objects usually produce higher pitched sounds. A sound source produces vibrations which travel through a medium from the source to our ears. Different mediums such as solids, liquids and gases can carry sound but sound cannot travel through a vacuum (an area empty of matter). The vibrations cause parts of our body inside our ears to vibrate, allowing us to hear (sense) the sound.	**Possible evidence:** Can name sound sources and state that sounds are produced by the vibration of the object. Can state that sounds travel through different mediums such as air, water, metal Can give examples to demonstrate how the pitch of a sound are linked to the features of the object that produced it Can give examples of how to change the volume of a sound e.g. increase the size of vibrations by hitting or blowing harder Can give examples to demonstrate that sounds get fainter as the distance from the sound source increases

	The loudness (volume) of the sound depends on the strength (size) of vibrations which decreases as they travel through the medium. Therefore, sounds decrease in volume as you move away from the source. A sound insulator is a material which blocks sound effectively. Pitch is the highness or lowness of a sound and is affected by features of objects producing the sounds. For example, smaller objects usually produce higher pitched sounds.	
	Key vocabulary: Eardrum, vibration, particles, pitch, volume, amplitude, sound wave, sound proof, ear canal, medium.	
	Cornerstones Investigations for this area of study. Use the TASC wheel for these investigations. **Can we block sound?** (N.C. 4.13;4.14)	
	Assessment guidance: Applying knowledge in familiar related contexts, including a range of enquiries	
	Key Learning: Classify sound sources Explore making sounds with a range of objects such as musical instruments and other household objects Explore how string telephones or ear gongs work Explore using objects that change in feature to change pitch and volume such as length of guitar string, bottles of water or tuning forks Measure sounds over different distances Measure sounds through different insulation materials	**Possible evidence:** Can explain what happens when you strike a drum or pluck a string and use a diagram to show how sounds travel from an object to the ear Can demonstrate how to increase or decrease pitch and volume using musical instruments or other objects Can use data to identify patterns in pitch and volume Can explain how loudness can be reduced by moving further from the sound source or by using a sound insulating medium
Year 4: Summer term 2 Electricity	**Electricity** • N.C. 4:15: identify common appliances that run on electricity • N.C. 4.16: construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers • N.C. 4.17: identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery • N.C. 4.18: recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit • N.C. 4.19: recognise some common conductors and insulators, and associate metals with being good conductors	
	Assessment guidance:	

	Shows understanding of a concept using scientific vocabulary correctly	
	Key Learning: Many household devices and appliances run on electricity. Some plug in to the mains and others run on batteries. An electrical circuit consists of a cell or battery connected to a component using wires. If there is a break in the circuit, a loose connection or a short circuit the component will not work. A switch can be added to the circuit to turn the component on and off. Metals are good conductors so they can be used as wires in a circuit. Non-metallic solids are insulators except for graphite (pencil lead). Water, if not completely pure, also conducts electricity	**Possible evidence:** Can name the components in a circuit Can make electric circuits Can control a circuit using a switch Can name some metals that are conductors Can name materials that are insulators
	Key vocabulary: Mains-powered, battery-powered, mains electricity, appliances, battery, electrical conductor, electrical insulator, circuit, bulb, cell	
	Cornerstones Investigations for this area of study. Use the TASC wheel for these investigations. **What conducts electricity?** (N.C. 4.16)	
	Assessment guidance: Shows understanding of a concept using scientific vocabulary correctly	
	Key Learning: Construct a range of circuits Explore which materials can be used instead of wires to make a circuit Classify the materials that were suitable/not suitable for wires Explore how to connect a range of different switches and investigate how they function in different ways Choose switches to add to circuits to solve particular problems such as a pressure switch for a burglar alarm Apply their knowledge of conductors and insulators to design and make different types of switch Make circuits that can be controlled as part of a D&T project N.B. Children should be given one component at a time to add to circuits.	**Possible evidence:** Can communicate structures of circuits using drawings which show how the components are connected Use classification evidence to identify that metals are good conductors and non-metals are insulators Can incorporate a switch into a circuit to turn it on and off Can connect a range of different switches identifying the parts that are insulators and conductors Can add a circuit with a switch to a DT project and can demonstrate how it works Can give reasons for choice of materials for making different parts of a switch Can describe how their switch works