Progression in Scientific Enquiry

Enquiry Type	KS1	LKS2	UKS2
Observation over time Pupils identify and measure events and changes in living things, materials and physical process or events. These observations may take place over time spans of minutes or hours (e.g. puddles evaporating) up to several weeks or months (e.g. rearing young chicks).	**Investigation question:** What happens to trees in each season? **Notes:** Observe changes across the four seasons. Take photos, look at a particular tree in the playground in each season and talk about how it changes **Investigation question:** How do our bodies change over time? **Notes:** Identify, name, draw and label basic parts of the human body. We bring pictures of us all when we were babies, look at what we did then to now. Links to research using secondary sources also **Investigation question:** How does a plant change as it grows? **Notes:** Observing a seed as it grows into a plant. Choose one that produces seeds (e.g. sunflower) so they can see the full lifecycle	**Investigation question:** Which liquid is the least healthy for our teeth? **Notes:** Boiled eggs – different liquids (e.g. cola, fruit shoot, water) see which breaks down the egg shell the quickest. What happens? **Investigation question:** How does water travel up the stem to the flowers? **Notes:** Suggest carnations or celery. Use food dye to see if it changes the colour of the carnation / celery – chop stem and notice the tubes in the stem which transport water	**Investigation question:** What conditions are needed for bread to go mouldy? **Notes:** Observe over a period of time bread in a sealed bag (CLEAPSS H&S) bread in a dark place; light space; dry space; wet space; fridge. Notice differences in multiplication of spores **Investigation question:** How are nutrients and water transported in the body? **Notes:** Skittles in water (diffusion) jelly snake left in water overnight (osmosis) gelatine in petri dishes – poke small holes, add small drops of food colouring with pipette observe it diffuse over time. Can link to research initially
Pattern seeking Pupils observe, measure and record events and systems when carrying out pattern seeking enquires. They also collect and interpret data from secondary sources. They make observations and	**Investigation question:** Just because we are older are we taller/bigger? **Notes:** Use Discovery Dog as story starter measured all children and saw who was tallest – looked at birthdays – were these children the oldest? **Investigation question:** Do our different body parts grow as we get older?	**Investigation question:** How are the teeth of an animal related to the type of food they eat? **Notes:** Classify/name enquiry initially leading to noticing teeth patterns so children are able to make statements such as carnivores have more sharp/pointy/grinding teeth **Investigation question:** How do growing conditions affect seed germination?	**Investigation question:** How does the planets distance from the sun affect its temperature? **Notes:** look at data of planet temperatures and sort into an orbit grid – discuss and identify any patterns **Investigation question:** How does the height/surface of a ramp affect how the car travels along it?

conduct surveys where the variables can't easily be controlled for practical or ethical reasons	**Notes:** Measuring the head size, hand span, height of children 4-11 years old – is there a pattern? – record and discuss findings	**Notes:** Place 10 seeds of the same type in different growing conditions: dark/wet, dark/dry, cold/wet, cold/dry etc. Look at patterns in germination. Can children identify most suitable growing conditions?	**Notes:** Provide ramps, cars, surfaces etc. – record distance travelled as one variable is altered
Identifying, classifying and grouping Pupils make sense of how the world is organised. Identification is the process of using differences to name something and classification is organising things into groups. Opportunities to identify arise when pupils recognise not all birds are the same for example and can identify and name them. They can then use observable and behavioural similarities to group them and add new things.	**Investigation question:** How can we group animals based on what they eat? (Classify/group) **Notes:** Sort pictures and information in to correct groups **Investigation question:** Identify the parts of your body. (Identify) **Notes:** Label body diagram to show body parts/we use internet or books to label **Investigation question:** Can you match the animal to its offspring? (Identify) **Notes:** Images of adult animals and using books to match/name.	**Investigation question:** Which materials are magnetic? Non-magnetic? (Identify) **Notes:** test different materials and sort them into hoops –magnetic/non- magnetic **Investigation question:** Classify the rocks according to simple physical properties / appearance (Classify) **Notes:** Use real rocks for the children to explore. Provide hand lenses and possible microscopes (digital?) **Investigation question:** Which materials are conductors/insulators? (Classify) **Notes:** The children build a simple circuit and test different materials to see if the bulb will light	**Investigation question:** How can we group materials based on their property? (Classify/group) **Notes:** ID mystery substance at a crime scene. Ensure they come up with their own key first. Use sorting hoops to sort materials. Allow children to sort the materials according to their own observations. Describing physical properties
Comparative and fair testing Helps pupils explore relationship between variables. Comparative tests children compare	**Investigation question:** Which material is best to build our dragon house from? (Book - A Dragon in a Wagon by Lynley Dodd) **Notes:** Compare and group everyday materials on basis of simple physical properties. Carry out simple tests to determine which material	**Investigation question:** What is the best material to reflect light? **Notes:** Road safety – what could you add to your jacket to make you more likely to be seen on your bike at dusk in winter? **Investigation question:**	**Investigation question:** How does the shape of an object affect the times it takes to travel through water? (Fair) **Notes:** Investigating the effects of water resistance on plasticine. Children make different shapes using plasticine and drop it in

one event with another e.g. does the red car go faster than the green car? A fair test identifies the causal relationship between two variables. E.g. does the height of the ramp affect how quickly the toy car rolls down the ramp and everything else remains the same.	is best based on attributes you would look for in a home – strong, waterproof, etc.	Where's the best place to dry washing? **Notes:** Mrs Wilmot's washing – how long does it take to dry? **Investigation question:** Which material makes the most effective sound proofing a music studio? **Notes:** Wrap same containers in different materials. Alarm clock inside – data logger to record decibels (dB)	water and time which shape takes the least/most time to reach the bottom **Investigation question:** Does increasing the voltage affect the brightness of the bulb? (Fair) **Notes**: Write a scientific question to prove it. Measure voltage and brightness of bulb and lux and controlled other variables **Investigation question:** Which bird 'beak' has adapted best for which type of bird 'food'? (Comparative) **Notes:** Understanding how adaptation is important to the survival of species. Bird 'food' – pipe cleaners, rice, raisins, playdough, bird seed. Bird 'beaks' – chopsticks, spoons, tweezers, clothes peg, small flat stones. Using a set of 'beaks' and test which beak works best for which bird food
Research using secondary sources Where the answer is found using secondary sources. This is usually where it is impossible or unsafe for pupils to answer with first-hand enquiries. This enquiry helps them evaluate sources, distinguish between fact and opinion and recognise conflicting evidence and bias.	**Investigation question:** Who lives in the Arctic/Antarctic? **Notes:** Books, ipads, given info to answer true or false questions **Investigation question:** Why do we need to exercise? **Notes**: Research and make a poster to promote the benefits **Investigation question:** Make a food chain using the animals in The Gruffalo **Notes:** Children read book, given animals out of book, create their own food chain	**Investigation question:** How are fossils formed? **Notes:** Use secondary sources/videos sped up time lapse **Investigation question:** What job do our muscles do? **Notes:** Labelling a diagram with a full explanation or selecting the correct information **Investigation question:** What do animals in African Grasslands eat?	**Investigation question:** How close / far away are the planets in our solar system away from the sun? **Notes:** Research each planet and find out how far away from the sun. Present in scaled way **Investigation question:** What impact has Charles Darwin had on how we think about evolution? **Notes:** research scientists using the internet, videos, books (What were they trying to find out?) **Investigation question:** What is in blood?

		Notes: finding out about the foods eaten by animals in the African grasslands and creating food chains **Investigation question:** How are sounds made? **Notes:** Altering and adding to their answers to the question after reading the Jules Pottle story on sound	**Notes:** Children research the 'job' and size of the red blood cells, white blood cells, platelets and plasma to earn parts of the blood from the blood bank (red jelly, marshmallows, rice & orange juice)