Science Year 4

Knowledge and Skills: Know and recall accurately key facts relevant to the science topics below.	Test Question, Apparatus, Prediction, Method, Fair Test, Results, Conclusion. Scientific Enquiry Children should be able to:	Examples Ideas for prompting scientific enquiry:
Living Things and Their Habitats • Recognise that living things can be grouped in a variety of ways. Vertebrate animals can be separated in five groups: fish, amphibians, reptiles, birds and mammals. Invertebrates: snails, slugs, worms, spiders and insects. Arachnids, molluscs, annelids, crustacean, gastropod. • Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. Group a wide selection of living things that include animals and flowering and non-flowering plants. • Recognise that environments can change and that this can sometimes pose dangers to living things. Use local environment where possible. Give positive and negative examples of human interference e.g. deforestation, nature reserve.	☐ Ask relevant questions and use different types of scientific enquiries to answer them. ☐ Make systematic observations and take accurate measurements. ☐ Gather, record and classify and present data. ☐ Report findings by presenting results and drawing conclusions. ☐ Identify differences, similarities or changes related to scientific ideas and processes. ☐ Report findings by presenting results and drawing conclusions. ☐ Record findings in; bar charts, tables, keys, graphs, drawings, labelled diagrams, branching diagrams. ☐ Gather, record, and classify and presentdata. ☐ Identify differences or similarities changes related to scientific ideas and processes. ☐ Record findings in; bar charts, tables, keys, graphs, drawings, labelled diagrams, branching diagrams. ☐ Carefully observe micro-habitats and recordfindings on a map of school using a key. ☐ Set up simple practical enquiries, comparative, and fair tests. ☐ Make systematic observations and take accurate measurements (measure temperature using thermometers °c). ☐ Report findings by presenting results and drawing conclusions (effect on habitat and wildlife). ☐ Make predictions, suggest improvements,and raise further questions. Investigation : Climate Change Greenhouse effect in a jar https://www.oxfam.org.uk/education/resources/climate-challenge-7-11	Recap seven characteristics of a living thing, MRS GREN. FHE: Show a variety of living things – what do they have in common? Use of local environment throughout the year. Art inspired by Levon Biss; large scale anatomical drawings of a variety of invertebrates. To allow close observation which helps to sort and classify. Visit from Rivers Trust - River Detectives activity. Test your classification key by playing 'Guess Who?' or 'What am I?' Forest School living things investigation. Plant a variety of plants that are bee-friendly, butterfly-friendly... Link to changes of habitat and impact on living things and micro-habitats. Visit new housing estates/building and discus effect on local habitats. Litter pick (link to dangers to wildlife).

Year 4 **Knowledge and Skills:** Know and recall accurately key facts relevant to the science topics below.	Test Question, Apparatus, Prediction, Method, Fair Test, Results, Conclusion. **Scientific Enquiry** Children should be able to:	**Examples** Ideas for prompting scientific enquiry:
Animals including Humans. • Describe the simple functions of the basic parts of the digestive system in humans. mouth, tongue, saliva, teeth, oesophagus, stomach, small and large intestine, rectum, anus, faeces • Identify the different types of teeth in humans and their simple functions. molar, pre-molar, incisor, canine, enamel. • Construct and interpret a variety of food chains, identifying producers, predators, and prey.	☐ Ask relevant questions and use different types of scientific enquiries to answer them. ☐ Make systematic observations and take accurate measurements. ☐ Report findings by presenting results and drawing conclusions. ☐ Use scientific evidence to support findings. ☐ Record findings using labelled diagram. First hand Demonstration of digestive system, e.g. https://www.stem.org.uk/resources/elibrary/resource /35396/digestive-system-experiment. ☐ Set up simple practical enquiries, comparative, and fair tests. ☐ Make systematic observations and take accurate measurements. ☐ Gather, record, and classify and presentdata. ☐ Make predictions, suggest improvements,and raise further questions. ☐ Record findings perhaps via a grading system on a scale or key. ☐ Report findings by presenting results and drawing conclusions. ☐ Use scientific evidence to support findings. Investigation: egg shell in water, milk, coke, vinegar (egg shell represents tooth). Observe over a number of days; photograph evidence. ☐ Make systematic observations and record findings. ☐ Ask relevant questions and use different types of scientific enquiries to answer them. FHE: place snails in a tank. Cucumber, salad leaves at one end and cooked meats at another ed Observe snails dietary preferences. Extension idea: blend cucumber and leaves, paint vertically to allow closer observation of snail's mouth during feeding.	Visit from doctor, dentist, school nurse to give information about dental hygiene and care. Different functions of teeth: look a variety of animal skulls and determine what their diet may be based on type of teeth. Use model of body and organs in class. Observe own teeth in a mirror and catalogue how many of each type you have. Record average number of teeth on a scatter graph. Observe variety of skulls and identify types of teeth. Food-chain art. Watch David Attenborough's animal programmes. Secret life at the zoo. Zoo visit.

Year 4 **Knowledge and Skills:** Know and recall accurately key facts relevant to the science topics below.	Test Question, Apparatus, Prediction Method, Fair Test, Results, Conclusion. **Scientific Enquiry** Children should be able to:	**Examples** Ideas for prompting scientific enquiry:
States of Matter • Compare and group materials together, according to whether they are solids, liquids, or gases. (Solids hold their shape, liquids form a pool not a pile, gases escape from an unsealed container). • 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). Pupils should observe water as a solid, liquid or gas and observe changes when it is heated or cooled. • Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. Teachers should avoid using materials where heating is associated with chemical change, e.g. through baking or burning.	☐ Identify differences, similarities or changes related to scientific ideas and processes. ☐ Use scientific evidence to support findings. ☐ Record findings in; bar charts, tables, keys, graphs, drawings, labelled diagrams. Identify a material as solid or liquid. Variety of materials, including dry sand, wood, metal, plastic, sugar salt, stones, fruit, water, washing up liquid, milk, honey, vinegar, jelly, shaving foam, bicarbonate of soda. Record findings in table. Containers with soil, stones, marbles. Using a magnifying glass, children observe as they slowly pour water into each container. (Bubbles of gas escape as water fills the space). Produce annotated drawings of observations. ☐ Make systematic observations and take accurate measurements. Measure a variety of temperatures ranging from 0 to 50 degrees Celsius. Record results in a table/on a graph. ☐ Set up simple practical enquiries, comparative, and fair tests. ☐ Make systematic observations and take accurate measurements (units of time). ☐ Make predictions, suggest improvements,and raise further questions. ☐ Report findings by presenting results and drawing conclusions. Investigation: Which chocolate will melt first? (Change state) Place milk, dark (high cocoa content) and white chocolate in a small foil case and put in a hot water bath (50 degrees Celsius). Measure the time taken for each type of chocolate to melt. ☐ Ask relevant questions and use different types of scientific enquiries to answer them. ☐ Identify differences, similarities or changes related to scientific idea and processes. ☐ Use scientific evidence to support findings. Water Cycle in a bag.	Use drama to model the three states of matters, e.g. children all packed together to mimic a solid, packed in rows holding hands moving slightly to vibrate (liquid), then dashing around the playground in all directions (gas). Drop mento into coca-cola. (do outside). Blow up balloons. Do not tie. Release around classroom (gases escape from unsealed containers). Make lava lamps. Ice water, water vapour (boil kettle in class), liquid water to demonstrate three states of water. Secondary sources e.g. video clips of metals melting and uses. (Different material have different melting points. Observation: Comparison of still drinks and fizzy drinks to note that the gas in fizzy is carbon dioxide. Quick-sand investigation – is it a solid or a liquid? Make chocolate crispy cakes or ice cream. Observe and measure puddles in the playground, at different intervals throughout the day. Paint a picture using water onto sugar paper. Observe. Repeat, but this time add heat (hair-dryer/sunny windowsill). Does the rate of evaporation change? Build a snowman. Eat ice-lollies o on a hot day. Observe clouds.

Y4 **Knowledge and Skills:** Know and recall accurately key facts relevant to the science topics below.	Test Question, Apparatus, Prediction, Method, Fair Test, Results, Conclusion. **Scientific Enquiry** Children should be able to:	**Examples** Ideas for prompting scientific enquiry:
Sound • Identify how sounds are made, associating some of them with something vibrating (use a range of musical instruments form around the world). • 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. • 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 (measure in decibels).	□ Ask relevant questions and use different types of scientific enquiries to answer them. □ Make systematic observations and take accurate measurements. □ Gather, record, and classify and presentdata. □ Set up simple practical enquiries, comparative, and fair tests. □ Make predictions, suggest improvements,and raise further questions. □ Record findings in; bar charts, tables, keys, graphs, drawings, labelled diagrams. □ Identify differences, similarities or changes related to scientific ideas and processes. □ Report findings by presenting results and drawing conclusions. □ Use scientific evidence to support findings Investigation: How is sound made? Give children a range of items to make sound from e.g. drum with rice, guitar, recorder, bottles with water in, tuning forks, xylophone, elastic bands to twang, ruler on edge of desk, feel voice box when speaking, tubes to speak into etc… Make a table of results to show how the sound is made. Investigation –Pitch. Test several elastic bands of different thicknesses/sizes of saucepan lids/glass bottles with differing amounts of water. Investigation: Make and test earmuffs using a variety of materials to insulate the noise e.g. bubble-wrap, foam, fur, plastic bag. □ Make systematic observations and take accurate measurements. Use data-loggers/decibel readers on iPad to predict and record noise level of different sounds/record it growing fainter as distance from source increases. .	Make and play own musical instruments. Show sound waves – look at sound wave data and observe why waves are closer together and far apart. Louder/quieter, higher/lower. Dogs can hear high pitched sound. Collect data from different rooms and measure sound. Predict which room is loudest/quietest. Use data loggers/decibel reader. Listen to music/musical instruments. Make a mouth organ out of 3 bottles. Play a 3-note tune. Play a 3-note tune on xylophones identifying high/low sounds. Create model of ear. Videos of wild animals hunting using sonar e.g., owl. Visit from local musicians.

Y4 Knowledge and Skills: Know and recall accurately key facts relevant to the science topics below.	Test Question, Apparatus, Prediction, Method, Fair Test, Results, Conclusion. **Scientific Enquiry** Children should be able to:	**Examples** Ideas for prompting scientific enquiry:
Electricity • Identify common appliances that run on electricity (mains/battery operated). • Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches, and buzzers. Pupilsshould draw the circuit as apictorial representation. (Circuit symbols introduced in Y6). • Identify whether a lamp will light in a simple series circuit, based on whether the lamp is part of a complete loop witha battery. • Recognise that a switch opens and closes a circuit and associate this with whether a lamp lightsin a simple series circuit. • Recognise some common conductors and insulators, and associate metals with being good conductors. Pupils should be taught about precautions for working safely with electricity (count items in and out).	□ Ask relevant questions and use different types of scientific enquiries to answer them. □ Set up simple practical enquiries, comparative, and fair tests. □ Make systematic observations and take accurate measurements. □ Gather, record, and classify andpresent data. □ Make predictions, suggest improvements, and raise furtherquestions. □ Record findings in; bar charts, tables, keys, graphs, drawings, labelled diagrams. □ Report findings by presenting results and drawing conclusions. □ Identify differences, similarities or changes related to scientific ideas and processes. □ Use scientific evidence to support findings. Investigation – Which of these materials could be used to make a switch? Test a variety of materials to see if they are electrical conductors or insulators e.g., 2p,10p, plastic spoon, foil, key, lolly stick, string, card etc. Investigation – What will happen if more bulbs are added to a circuit? What will happen if more batteries are added to a circuit?	Create a toy e.g., hand steadinessgame, buzzer for a game show, headlights for a toy car. Make different types of switches using paper clips, drawing pins, nails, hammer, wood, and foil. Observe lots of different switches and categorize as push, pull, slide,or turn. Observe pylons, train-lines, and sub-stations in locality. Link to safety and looking for symbols that show danger. Appoint an eco-team to conserve electricity usage. Watch videos on how electricity is made. Include renewable sources. Learn about Benjamin Franklin and his kite experiment. Rub a balloon against clothing /hair to create static electricity. You tube – 9 awesome science tricks using static electricity. Demonstrate some of the ideas in class. Playdough circuits. Hold a 'no electricity day' so see how everyday life is affected. Visit from Electrical engineer.