Year 4 Science long term plan

Year 4 Term 2	Year 4 Term 3	Year 4 Term 1	Year 4 Term 4	Year 4 Term 5	Year 4 Term 6
States of matter **Preteach – What do I already know about solids, liquids and gases?** **Lesson 1 – How can I compare and group materials?** Compare and group materials together, according to whether they are solids, liquids or gases. **Lesson 2 – What is a gas?** Compare and group materials together, according to whether they are solids, liquids or gases. **Lesson 3 - 4 – What happens when materials are heated?** **(Formal investigation write up)** Observe that some materials change state when they are heated and measure or research the temperature at which this happens in degrees Celsius (°C). Group and classify a variety of materials according to the impact of temperature on them. Relate temperature to change of state of materials. Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. Setting up simple practical enquiries, comparative and fair tests. Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. 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. Report findings from investigations through written explanations and conclusions. **Lesson 5 – How do I present my scientific results on a graph?** Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. Record more complex data and results using scientific diagrams, classification keys, tables, bar charts, line graphs and models. Use a graph or diagram to answer scientific questions.	**States of matter** **Preteach – What do I already know about states of matter?** **Lesson 1 – 2 – Do all liquids freeze?** **(Formal investigation write up)** 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). Group and classify a variety of materials according to the impact of temperature on them. Relate temperature to change of state of materials. Asking relevant questions and using different types of scientific enquiries to answer them. Setting up simple practical enquiries, comparative and fair tests. Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. Plan and carry out an investigation by controlling variables fairly and accurately. 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. Use test results to make further predictions and set up further comparative tests. **Lesson 3 – What happens to water when it is heated?** Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. Explain what happens over time to materials such as puddles on the playground or washing hanging on a line. Relate temperature to change of state of materials. **Lesson 4 – What is condensation?** Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. Relate temperature to change of state of materials. **Lesson 5 – What happens during the water cycle?** Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	**Animals, including humans** **Preteach – What do I already know about the human body and food chains?** **Lesson 1 – What are the different types of human teeth and what are their functions?** Identify the different types of teeth in humans and their simple functions. **Lesson 2 – Which drink is the most harmful to our teeth?** **(Formal investigation write up)** Asking relevant questions and using different types of scientific enquiries to answer them. Setting up simple practical enquiries, comparative and fair tests. Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. 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Using straightforward scientific evidence to answer questions or to support their findings. **Lesson 3 – What happens when we chew our food?** Describe the simple functions of the basic parts of the digestive system in humans. **Lesson 4 – How is our food digested?** Describe the simple functions of the basic parts of the digestive system in humans. **Lesson 5 – How does the stomach work?** Describe the simple functions of the basic parts of the digestive system in humans. **Lesson 6 – What is the function of the intestines?** Describe the simple functions of the basic parts of the digestive system in humans.	**Sound** **Preteach – What do I already know about sound?** **Lesson 1 – How are sounds made?** Identify how sounds are made, associating some of them with something vibrating. Recognise that vibrations from sounds travel through a medium to the ear. **Lesson 2 – How can I change the pitch of a sound?** Find patterns between the pitch of a sound and features of the object that produced it. Explain how pitch and volume can be changed in a variety of ways. **Lesson 3 – How can I change the volume of a sound?** Find patterns between the volume of a sound and the strength of the vibrations that produced it. Explain how pitch and volume can be changed in a variety of ways. **Lesson 4 – Can sound travel through different materials?** Recognise that vibrations from sounds travel through a medium to the ear. Work out which materials give the best insulation for sound. **Lesson 5 – 6 – What is the relationship between volume and distance?** **(Formal investigation write up)** Recognise that sounds get fainter as the distance from the sound source increases. Explain why sound gets fainter or louder according to the distance. Asking relevant questions and using different types of scientific enquiries to answer them. Setting up simple practical enquiries, comparative and fair tests. Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. Plan and carry out an investigation by controlling variables fairly and accurately. 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.	**Electricity** **Preteach – What do I already know about electricity?** **Lesson 1 – Which appliances run on electricity?** Identify common appliances that run on electricity. **Lesson 2 – How do I construct a working electrical circuit?** Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. **Lesson 3 – How do I make the brightest bulb possible?** **(Formal investigation write up)** 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. Explain how a bulb might get lighter. Asking relevant questions and using different types of scientific enquiries to answer them. Setting up simple practical enquiries, comparative and fair tests. 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Using straightforward scientific evidence to answer questions or to support their findings. **Lesson 4 – Which materials make good electrical conductors or insulators?** Recognise some common conductors and insulators, and associate metals with being good conductors. Recognise if all metals are conductors of electricity. **Lesson 5 – How do switches work?** Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. Work out which metals can be used to connect across a gap in a circuit.	**Living things and their habitats** **Preteach – What do I already know about classifying animals?** **Lesson 1 – What lives in our local habitat?** Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. Asking relevant questions and using different types of scientific enquiries to answer them. Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. **Lesson 2 – How can changes in the environment affect things that live there?** Recognise that environments can change and that this can sometimes pose dangers to living things. **Lesson 3 - 4 – Which habitat is suitable for a woodlouse?** **(Formal investigation write up)** Recognise that environments can change and that this can sometimes pose dangers to living things. Asking relevant questions and using different types of scientific enquiries to answer them. Setting up simple practical enquiries, comparative and fair tests. Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. Plan and carry out an investigation by controlling variables fairly and accurately. 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	Relate temperature to change of state of materials.	**Lesson 7 – What happens in a food chain?** Construct and interpret a variety of food chains, identifying producers, predators and prey. Explain how certain living things depend on one another to survive. Explain how people, weather and the environment can affect living things.	Using straightforward scientific evidence to answer questions or to support their findings.	**Lesson 6 – How can I be safe around electricity?** Explain why cautions are necessary for working safely with electricity.	Name and group a variety of living things based on feeding patterns (producer, consumer, predator, prey, herbivore, carnivore, omnivore). **Lesson 6 – How do I use a classification key?** ***Year 1 grouping animals** Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. Give reasons for how they have classified animals and plants, using their characteristics and how they are suited to their environment.
Resources					
Focus scientist for display: Prafulla Chandra Ray - Bengali chemist, he established the first modern Indian research school in chemistry and is regarded as the father of chemical science in India.	**Model of the water cycle** **Focus scientist for display: Gitanjali Rao - American inventor, author, scientist and engineer, and science, technology, engineering, and mathematics (STEM) promoter. When she was 10, Rao heard about the Flint water crisis while watching the news and became interested in ways to measure the lead content in water. This led to her using App Inventor to develop a device called Tethys that could send water quality information via Bluetooth.**	**Focus scientist for display: Sophia Louisa Jex-Blake - an outstanding pioneer who fought hard for the rights of women to practise medicine.**	**Focus scientist for display: James E West – inventor of the foil electret microphone, one of the most commonly used microphones in the world.**	**Famous scientist for display: Granville T. Woods - Known as "Black Edison," Granville Woods was an African American inventor who made key contributions to the development of the telephone, streetcar and more.**	**Famous scientist for display: Joy Adamson - conservationist who pioneered the movement to preserve African wildlife.**