

Science Curriculum – Year 4

Working scientifically (Skills objectives across all units):

- 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
- Gathering, recording, classifying and presenting data in a variety of ways to help in answering 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.

Animals including humans

Learning Objectives:

- I can describe the simple functions of the basic parts of the digestive system in humans
- I can identify the different types of teeth in humans and their simple functions
- I can construct and interpret a variety of food chains, identifying producers, predators and prey.

Challenge:

- I can explain how the body breaks down food - digestion - using the idea of molecules.
- I know that our blood carries energy from food around the body.

Investigation Ideas:

- Which cereal has the most iron in it? (Practical investigation using magnets)
- Which chocolate bar is most unhealthy? (Comparing food labels)
- Which drink causes the most damage to teeth? (leaving dirty coins in different drinks to compare the effects or use eggs and leave in different drinks for a set amount of time)

Resources you may need:

- 3D Model of the human body to explore organs.
- Arrange a visit from a dentist/health visitor or school nurse.
- Pond dipping - who eats who? Record with a video to go on the school website.
- Egg shells/dirty coins
- Variety of drinks
- Camera
- Model of teeth

Electricity

Learning Objectives:

- I can identify common appliances that run on electricity
- I can construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers
- I can 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
- I can recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit
- I can recognise some common conductors and insulators, and associate metals with being good conductors.

Challenge:

- I can use recognised symbols when representing a simple circuit in a diagram.
- I can associate the brightness of a lamp/volume of a buzzer with the number and voltage of cells in a circuit.

Investigation Ideas:

- To identify electrical appliances around us.
- To investigate conductors and insulators.
- To make and test a switch.
- To make and compare simple circuits - series only.
- To observe differences in circuits and find trends between the number of batteries and the observed effects in the circuit.
- To find out how electricity is made.
- To make and test wind turbines and solar panels.

Resources you may need:

- LED's etc for electrical buzz game.
- Batteries, lamps, buzzers, motors, wires, crocodile clips, variety of switches,
- Conductive and insulator playdoh
- Materials to test - conductors and insulators
- Pictorial representation of a circuit identifying symbols

Living things and their habitats

Learning Objectives:

- I can recognise that living things can be grouped in a variety of ways
- I can explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment
- I can recognise that environments can change and that this can sometimes pose dangers to living things.

Challenge:

- I can describe the life cycles common to a variety of animals, including humans (birth, growth, development, reproduction, death), and to a variety of plants (growth, reproduction and death)

Investigation Ideas:

- What insects live in our local environment?
- What plants live on our school playing field?
- Which weed is most successful - daisy or dandelion?
- How have populations of animals changed when their environments have changed?
Deforestation in the rainforest, Hunting and Ivory trade in Africa, Palm Oil trade in Borneo etc Data based investigation.
- How have humans helped protect animals and their habitats? Local case study if possible

Resources you may need:

- Images of plants, animals and habitats
- Collection of newspaper articles about environmental issues - local and international
- Leaflet from organisations that protect endangered species or habitats
- Selection of identification keys - bug hunting, local plants/trees and pond dipping
- Bird table, food, binoculars etc
- Log pile and bug hotels - school nature area
- Camera to take photos of insects in school or around local area/park

Sound

Learning Objectives:

- I can identify how sounds are made, associating some of them with something vibrating
- I can recognise that vibrations from sounds travel through a medium to the ear
- I can find patterns between the pitch of a sound and features of the object that produced it
- I can find patterns between the volume of a sound and the strength of the vibrations that produced it
- I can recognise that sounds get fainter as the distance from the sound source increases.

Challenge:

- I understand that sound waves carry energy.
- I can describe and compare the frequencies of sound waves.

Investigation Ideas:

- How do different instruments make sounds?
- How do we make sounds louder and quieter?
- What materials can sound travel through?
- What materials will stop sound travelling?
Sound proofing
- How does the volume of sound change with distance?

Resources you may need:

- Variety of instruments
- Junk materials to make instruments
- Materials to absorb sound
- Data logger with decibel sensor
- Tape measure
- Model of the inner ear - labelling activity?

States of Matter

Learning Objectives:

- I can compare and group materials together, according to whether they are solids, liquids or gases
- I can 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 ($^{\circ}\text{C}$)
- I can identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

Challenge:

- I can use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.
- I can demonstrate that changes of state are reversible changes.

Investigation Ideas:

- What which melts fastest - Ice cream, butter or ice?
- Which evaporates quickest - water, vinegar or nail varnish remover?
- How does the temperature of ice cream change over time?
- How does the temperature of wax/water change as you heat it up?
- Which type of chocolate melts fastest?
- How do they make condensed and evaporated milk?
- What conditions make washing dry quicker?

Resources you may need:

- Video clips - molten rock and metal
- Access to freezer
- Thermometers
- Data loggers and temperature sensors
- Ice cream, butter, wax, vinegar, nail varnish remover, chocolate, condensed and evaporated milk
- Jam jars and ice cubes
- Variety of solids, liquids, gases (steam, aerosol can)