

Science Curriculum – Year 6

Working scientifically (Skills objectives across all units):

- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- using test results to make predictions to set up further comparative and fair tests
- reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations
- Identifying scientific evidence that has been used to support or refute ideas or arguments.

Animals including humans

Learning Objectives:

- I can identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood
- I can recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function
- I can describe the ways in which nutrients and water are transported within animals, including humans.
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Challenge:

- I can recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function
- I can describe the ways in which nutrients and water are transported within animals, including humans.
- I can describe the process of respiration.

Investigation Ideas:

- Investigating nutrition content using food labels - Which is the unhealthiest chocolate bar/snack? How healthy are ready meals?
- Investigating the effect of exercise on our heart rate.
- How does water travel around our body?
- How do muscles work? Modelling with paper tubes and rubber bands - investigating muscles in different movements.
- Exploring the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health.

Resources you may need:

- Meet a doctor, health visitor or fitness instructor.
- Ready meals
- Packets/tins and food labels
- Models of muscles/nerves

Living things and their habitats

Learning Objectives:

- I can describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals
- I can give reasons for classifying plants and animals based on specific characteristics.

Challenge:

- I can explain how living things are adapted to different habitats.

Investigation Ideas:

- How many groups can plants be organised into and what are their characteristics? Children investigate plant samples provided.
- How many groups can animals be organised into and what are their characteristics? Children use images of a variety of animals.
- Modelling microorganisms - children create plasticine models of magnified bacteria, virus' and fungi - create fact files about each one they make and then work collaboratively to group and compare.
- Investigating a habitat - field trip - what plants and animals can be found and how do they depend on each other. (Pond dipping/bug hunt)
- What conditions do woodlice/maggots prefer?

Resources you may need:

- Plant samples
- Images of animals
- Plastic models of animals
- Plasticine and petri dishes
- Images of microbes
- Plastic bags, bread - growing microbes

Potential science field trips:

- Local - Bug Hunt & Pond dipping
- Zoo, wildfowl centre etc - variety of species
- Snail hunt

Evolution and inheritance

Learning Objectives:

- I can recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago
- I can recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents
- I can identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

Challenge:

- I can explain how variation leads to competition which can drive adaptation
- I understand that changes in the environment that leave some species less well adapted to compete successfully and reproduce.

Investigation Ideas:

- Investigating variation in the classroom - height, weight, hair colour, shoe size etc Data collection and graph drawing to analyse.
- What differences are environmental and what differences are inherited from our parents? Children can bring in family photos to make comparisons or you can provide a set of family photos.
- How are birds adapted to survive on their island? Investigation to replicate the work of Darwin in the Galapagos Islands using various size tweezers to pick up various food stuffs - small and large nuts, worms and large fruit.
- Making fossils - how are they made?
- Comparing skeletons of humans, with Neanderthals and apes. Using images to observe similarities and differences.

Resources you may need:

Various measuring equipment for investigating variation in children - scales, tape measures etc.

Nuts, dried meal worms, plums, tweezers, sugar tongs, salad server tongs, BBQ tongs.

Charles Darwin Horrible Histories Song.

Family photos of 3-4 generations - teachers own or children can bring in.

Photos of a variety of animals to show inheritance.

http://darwin200.christs.cam.ac.uk/pages/index.php?page_id=j2

Light

Learning Objectives:

- I can use the idea that light travels in straight lines
- I can use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye
- I can explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes
- I can use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.

Challenge:

- I can explain how the human eye works.
- I can explain the dispersion of light.
- I can describe how some transparent materials bend light rays.

Investigation Ideas:

- Investigating light levels in the school/local environment - identifying sources. Data collection and bar graph analysis
- Investigating plane mirrors - ray diagrams
- Investigating curved mirrors - making careful observations
- What is the relationship between the distance from the object to the shadow and the size of the shadow? Data collection and line graph analysis
- Is it easier for light to travel through a thin transparent material or a thick one?
- Investigating lenses and magnification
- Investigate the dispersion of light through a prism.

Resources you may need:

- Torches/Ray boxes
- Data loggers - light meters
- Protractors and rulers
- Prisms
- Lenses
- Shoeboxes, greaseproof and black paper for pinhole camera (possibly photographic paper).
- Microscopes
- Telescope/binoculars
- Materials to make shadow sticks
- Mirrors - plane, concave/convex
- Metre rulers
- Transparent/translucent and opaque materials
- Coloured filters

Electricity

Learning Objectives:

- I can associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit
- I can compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches
- I can use recognised symbols when representing a simple circuit in a diagram.

Challenge:

- I can describe how voltage changes in a series and parallel circuit.

Investigation Ideas:

- Constructing circuits and drawing circuit diagrams.
- Comparing series and parallel circuits.
- Investigation: How does voltage (number of batteries) affect the brightness of lamps?
- Investigation: How does voltage (number of batteries) affect the volume of a buzzer?
- Fruity batteries - measuring voltage to find which fruit makes the best battery.
- Squidgy circuits - using conductive dough to create electrical art sculpture.

Resources you may need:

- LED's etc for electrical buzz game.
- Batteries, lamps, buzzers, motors, wires, crocodile clips, variety of switches,
- Pictorial representation of a circuit identifying symbols