Class 3 Science Essential Knowledge

Cycle A (2024-2025)

Autumn 1: Electricity (Y6)

Electricity - By the end of this unit what should children know?
Symbols can be used to represent a simple circuit in a diagram. Recognise and use the symbols for a battery/cell, bulb, motor, switch, wires and buzzer and explain why symbols are used instead of pictures.
The brightness of a lamp is associated with the number and voltage of cells used in the circuit.
Components can function differently according to the circuit, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches.
Energy can be renewable or non-renewable and name sources of each. Be able to explain advantages and disadvantages of both methods of generating electricity.
Know what pylons are and how they are linked to electricity. Understand that new pylons are proposed to be erected in Morley and give their opinion on these.
Vocabulary – Cell, Circuit, Component, Crocodile clip, Current, Electrons, Filament, Flow of electricity, Mains, Non-renewable, Parallel, Pylon, Renewable, Resistance, Resistor, Voltage

Autumn 2: Properties and Changes in Materials (Y5)

Properties and Changes in Materials - By the end of this unit what should children know?
Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets.
Know that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution - demonstrate that dissolving, mixing and changes of state are reversible changes.
Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.
Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible.
Vocabulary – solid, liquid, gas, thermal, reversible, non-reversible, filtering, sieving, separating, substance, state

Spring 1: *Forces (Y5)*

Forces - By the end of this unit what should children know?
That unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object
Identify the effects of air resistance, water resistance and friction, that act between moving surfaces
Recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect.
Vocabulary - force, pulley, lever, mechanism, resistance, gravity, friction, balanced, surface

Spring 2: *Living Things and Their Habitats (Y5)*

Living Things & Their Habitats - By the end of this unit what should children know?
How to describe the differences in the life cycles of a mammal (hedgehog), an amphibian (lizard), an insect (mantis) and a bird. Broomfield link – How do wallabies differ from mammals?
Observe the butterfly life cycle in action and release butterflies into the wild when fully developed.
Observe life cycles in action e.g. dragon flies, frogs at local nature reserve/Morley Hayes Pond.
How to describe the process of reproduction in some plants. Idenitfy plants which reproduce sexually and asexually. Link with Broomfield Garden Centre.
Vocabulary – Asexual, Bulb, Cutting, Embryo, Fertilise, Foetus, Gestation, Life Cycle. Metamorphosis, Reproduction, Runner, Sexual, Tuber

Summer 1: *Living Things and Their Habitats (Y6)*

Classification - By the end of this unit what should children know?
Pupils should know how micro-organisms, plants and animals are classified into broad groups according to common observable characteristics and based on similarities and differences.
Pupils should be able to give reasons for classifying plants and animals based on specific characteristics.
Vocabulary – Class, Classify, Family, Eukaryote, Genus, Kingdom, Taxonomy, Micro-organism, Order, Phylum, Species

Summer 2: *Animals including Humans (Y5)*

Animals Including Humans - By the end of this unit what should children know?
How to describe the changes as humans develop to old age.
To understand the different stages in the growth and development of humans. Particularly focusing on the changes experienced in puberty. (Strong link to PSHE unit).
Vocabulary – gestation, development, puberty, adolescent, foetus, embryo, youth, adult, mature, womb, fertilisation, egg, sperm

Class 3 Science Essential Knowledge

Cycle B (2025-2026)

Autumn 1: Earth in Space (Y5)

Earth in Space: By the end of this unit what should children know?
That the Sun, Earth, and Moon are approximately spherical bodies.
How to describe the movement of the Earth, and other planets relative to the Sun in the Solar System.
How to describe the movement of the Moon, relative to the Earth.
Why day and night occur, due to the Earth's rotation and why the Sun appears to move across the sky.
Vocabulary – Asteroid, Astronomy, Astronomer, Axis, Celestial body, Crescent, Geocentric, Gibbous, Heliocentric, Horizon, Lunar, Orbit, Rotation, Waning, Waxing

Autumn 2: Light (Y6)

Light: By the end of this unit what should children know?
Light travels in a straight line. Light travels very, very fast (186,282 miles per second – that is like travelling the world over 7 times in a second.)
If something gets in the way of light, a shadow is formed. The shadow can change size according to the distance away from the light source. Link to Derby 'Shine a Light' project.
We see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. The image on the retina has been turned upside down because the front of the eye is curved. Create their own 'Ask a Scientist' questions for Jim Campbell.
Extend their experience of light by looking at a range of phenomena such as objects looking bent in water. Create their own 'Ask a Scientist' questions for Jim Campbell.
Extend their experience of light by looking at a range of phenomena such as how we see colour e.g. rainbows, prisms and a spectrum of light.
Vocabulary - Absorb, Cast, Concave, Convex, Cornea, Filter, Iris, Light ray, Lens, Luminous, Non-luminous, Optics, Periscope, Prism, Pupil, Refraction, Retina, Sclera, Transmission

Spring 1: *Animals including Humans (Y6)*

Animals, Including Humans – By the end of this unit what should children know?
That the function of the heart (muscular organ) is to pump oxygenated blood around the body. How to measure pulse rate and compare with different sized animals.
The circulatory system is made of the heart, lungs, blood vessels and capillaries. Arteries carry oxygenated blood from the heart to the rest of the body. Veins carry deoxygenated blood from the body to the heart.
The structure of the heart – Jim Campbell heart dissection.
Some choices, such as smoking and drinking alcohol can be harmful to our health. Create a local campaign to reduce smoking to send to Pauline Latham.
Explore the work of Derby University scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle, and health. (Linked to COVID-19 pandemic).
Vocabulary – Aorta, Artery, Atrium, Blood vessels, Capillary, Carbon Dioxide, Chamber, Circulatory System, Deoxygenated, Heart, Lungs, Nutrients, Organ, Oxygen, Oxygenated, Pulmonary, Pulse, Respiration, Veins, Vena Cava, Ventricle

Spring 2: *Evolution and Inheritance (Y6)*

Evolution and Inheritance – By the end of this unit what should children know?
Identify how animals and plants are adapted to suit their environment in different ways. Observe and raise questions about how local animals are adapted to their environment.
Visit Broomfield College to study animals and plants from a range of different environments around the world. Recognise the advantages and disadvantages of specific adaptations of animals at Broomfield e.g. meerkat, wallaby, porcupine.
Understand evolution by natural selection. Understand how the peppered moth has evolved and changed due to the industrial revolution (Derwent valley link).
Charles Darwin, an evolutionary scientist, studied different animals and plants species, which allowed him to see how adaptations could come about. L5inks to Erasmus Darwing (Grandfather of Charles) who lived at Breadsall Priory.
Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.
Vocabulary – Adaptation, Ancestor, Biodiversity, Characteristics, Environment, Evolution, Extinct, Feature, Inherit, Maladaptation, Mutation, Natural, Offspring, Reproduction, Selection, Species, Traits, Variation,