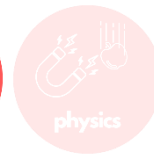


Science Knowledge



Year 1

Term 3 – Everyday Materials

Key Vocabulary:

Glass, metal, rock, plastic, wood, transparent, waterproof, opaque, materials, stiff, soft, shiny, rough, bendy, stretchy, absorbent, smooth, dull, hard

Substantive Knowledge

Pupils will:

- recognise an object that is made from plastic, fabric, metal and wood
- know an object or material is waterproof if it keeps water out and keeps things dry
- identify an absorbent material by knowing if something is absorbent, it soaks liquid up
- recognise the difference between transparent and opaque objects by knowing transparent objects can be seen through and opaque object cannot

Procedural Knowledge

Pupils will:

- develop observational skills to explore and name different materials, learning to categorise materials based on their properties
- identify and name the materials used in everyday objects
- participate in experiments to determine whether materials are waterproof or absorbent, formulating hypotheses about the properties of materials
- express scientific observations and findings using appropriate terminology
- record observations systematically during investigations
- use basic measurement tools to quantify material properties (e.g., size, weight)



Year 2

Term 1 – Living Things & Their Habitats

Key Vocabulary:

Life process, living, non-living, dead, movement, respiration, sensitivity, growth, reproduction, excretion, nutrition, habitat, conditions, survive, minibeast, microhabitat, enquiry, survey, pictogram, habitat, adaptation, dependency, food chain, herbivore, carnivore, omnivore

Substantive Knowledge

Pupils will:

- recognise things that are living, dead, and have never been alive
- list the 7 life processes, using the acronym MRS GREN (Movement, Respiration, Sensitivity, Growth, Reproduction, Excretion, Nutrition)
- match animals to the correct habitat, showing an awareness of the basic needs of different kinds of animals
- define a habitat as a natural place where something lives, providing food, shelter and water
- recognise a microhabitat as a very small habitat where minibeasts live
- name animals that share a food chain, realising that they are dependent on one another to survive

Procedural Knowledge

Pupils will:

- interpret food chains to determine the diet of other animals, including recognising the predator and prey of a food chain
- identify and sort objects and animals by classifying whether they are alive, dead or never been alive
- gain awareness of how human activities can impact habitats and the organisms that inhabit them. They will learn about the importance of conservation and sustainable practices to protect habitats and biodiversity
- use guides, charts, or digital resources to recognise and classify plants, animals, and other living organisms
- study predator-prey relationships and how these interactions contribute to the balance of populations within ecosystems



Year 2

Term 3 – Uses of Everyday Materials

Key Vocabulary:

Waterproof, rubber, rock, macadamisation, paper, cardboard, wood, metal, plastic, glass, brick, twist, stretch, squash, bend, recycling

Substantive Knowledge

Pupils will:

- list sand, logs and cotton as natural objects and a plastic bottle, brick, paper and metal ring as humanly-constructed
- recognise leather as a material that is waterproof, flexible and strong
- suggest plastic, glass and metal as appropriate materials for a spoon

Procedural Knowledge

Pupils will:

- identify and name different materials, sorting and categorising materials based on their properties
- evaluate the suitability of materials for specific purposes
- understand how materials can be manipulated to change their shape
- develop an understanding of the environmental impact of material use and disposal
- collect data through experiments and observations, conducting experiments to explore the properties of materials
- develop the ability to ask questions about the properties and uses of materials



Year 3

Term 1 – Light

Key Vocabulary:

Light, dark, source, reflect, illuminate, visible, rays, UV light, UV rating, retina, pupil, protect, energy, ray, beam, travel, opaque, translucent, transparent, shadow, observe, size, distance

Substantive Knowledge

Pupils will:

- identify a candle, the sun and a torch as a light source
- define darkness as the absence of light
- recognise light will reflect on a shiny surface
- list the dangers of UV light including sun burn, wrinkles, skin cancer, damage to eyes and changing the colour of some materials
- explain that UV light is stronger at midday, during summer, nearer the equator and when reflected on water, sand and snow surfaces
- know different ways they can protect themselves from UV light
- understand that a shadow is formed when a opaque object blocks the light rays
- know a shadow can be made bigger by moving the object closer to the light source

Procedural Knowledge

Pupils will:

- develop skills in making observations, recording data, and drawing conclusions based on their experiments
- explore concepts such as the speed of light, the direction of light rays, and how light travels in straight lines
- observe the characteristics of reflective surfaces, including mirrors, and how they can redirect light
- develop an understanding of how light and darkness are related
- investigate the relationship between light, objects, and the resulting shadow patterns



Year 3

Term 3 – Forces and Magnets

Key Vocabulary:

Force, push, pull, friction, surface, magnet, magnetic field, magnetic, pole, attract, repel

Substantive Knowledge

Pupils will:

- define a force as a push or a pull acting on an object
- identify iron, steel, nickel and cobalt as magnetic metals
- understand magnets either attract or repel, describing magnets as having two poles

Procedural Knowledge

Pupils will:

- develop the ability to identify forces in different situations
- use a magnet to separate materials based on their magnetic properties, identifying and classifying materials as magnetic or non-magnetic
- conduct experiments and collect data on the strength of different magnets
- compare and contrast the strength of different magnets, representing data graphically to analyse and compare results
- formulate questions about forces and magnetism
- understand the practical applications of forces and magnets in daily life



Year 4

Term 1 – Sound

Key Vocabulary:

Sound, vibration, volume, loud, quiet, travel, wave, particles, ear, amplitude, high, low, pitch, distance

Substantive Knowledge

Pupils will:

- explain a sound is created through vibrations, with louder sounds being created from bigger vibrations
- know sound travels as a wave, vibrating the particles in the medium it is travelling in
- recognise that sounds get fainter as the distance from the sound source increases
- define pitch as how low or high a sound is, recognising the difference between this and amplitude (the size of a vibration)
- know sound travels faster than light
- understand a sound is heard due to the eardrum vibrating in an ear
- locate the eardrum on a diagram

Procedural Knowledge

Pupils will:

- listen and observe their surroundings to identify and categorise various sounds
- explore how different objects and materials can vibrate to create sound waves
- use musical instruments or other objects to manipulate pitch and observe the resulting changes
- observe how sound travels in different mediums
- investigate how the intensity or loudness of a sound can vary based on the distance from the sound source
- engage in scientific inquiry and apply scientific method. They will develop skills in formulating questions, making predictions, planning and carrying out experiments, collecting and analysing data, and drawing conclusions based on their observations



Year 4

Term 3 – Electricity

Key Vocabulary:

Electricity, mains, wires, appliances, conductor, switch, cell, battery, insulator, bulb, circuit, power, buzzer

Substantive Knowledge

Pupils will:

- identify electrical appliances that are battery or mains powered
- define a series circuit where components are connected with wires in a loop and electricity flows around a single pathway
- know mains electricity is electricity supplied through wires to a building
- know all components in a circuit must be connected correctly for it to work
- know a conductor of electricity is a material that will allow electricity to flow through it
- recognise materials that are electrical insulators do not allow electricity to flow through them
- name the components of a basic electrical circuit: wires, batteries and bulbs

Procedural Knowledge

Pupils will:

- develop observational skills to identify and differentiate between mains and battery-powered appliances
- build simple circuits, identifying and correcting issues
- design experiments to investigate the conductivity of different materials
- understand the purpose and function of a switch in an electrical circuit
- understand and follow safety protocols when working with electricity
- record observations during experiments, analysing data, formulating questions and forming hypotheses



Year 5

Term 1 – Forces

Key Vocabulary:

Force, push, pull, gravity, air resistance, water resistance, friction, newton, newton meter, weight, mass, prediction, investigation, measure, observe, variable, results

Substantive Knowledge

Pupils will:

- identify gravity as a force that pulls things towards the centre of the earth
- recognise Isaac Newton as the person who discovered gravity
- know that air resistance is when air pushes against any object moving through it
- understand that objects will fall at the same rate when on the moon due to the absence of air
- explain water resistance as a type of friction caused by water pushing against an object
- identify an object that is streamlined, knowing that it reduces the effect of air and water resistance
- recognise a pulley, lever and gear mechanism

Procedural Knowledge

Pupils will:

- develop skills in formulating hypothesis, designing experiments, collecting and analysing data, and drawing conclusions based on their observations
- explore the concept of different forces, developing an understanding of how these forces affect the motion and behaviour of objects
- understand how to design a fair test and accurately measure and record data by applying their knowledge of independent, dependent and controlled variables
- develop skills in communicating their findings and understanding through conclusions and reports



Year 5

Term 3 – Earth and Space

Key Vocabulary:

Earth, sun, moon, planets, star, solar system, Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, rotate, day, night, orbit, axis, spherical, heliocentric, geocentric

Substantive Knowledge

Pupils will:

- identify the Earth, sun and moon as spherical bodies
- memorise and understand the order of the planets in the solar system, grasping the concept that the order is based on the distance of planets from the sun
- know the Earth orbits the sun (taking 365 days) and the moon orbits the Earth (taking just over 27 days)
- recognise the sun as a star
- explain the difference between a heliocentric and geocentric model of a solar system
- know we have night and day because the Earth rotates on an imaginary line called an axis. During daytime their part of the Earth is facing the sun, nighttime is when the sun is no longer visible

Procedural Knowledge

Pupils will:

- engage in observations of the night sky to identify celestial bodies, monitoring the changing phases of the moon over time
- conduct experiments or simulations to understand concepts like lunar phases and the movement of the planets
- ask questions about celestial phenomena and form hypotheses
- engage in discussions with peers about astronomical concepts



Year 6

Term 1 – Light

Key Vocabulary:

Light, source, wave, ray, beam, reflection, reflect, refraction, refract, transparent, bend, lens, shadow, opaque, incidence

Substantive Knowledge

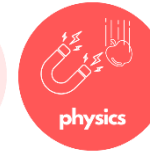
Pupils will:

- list and identify three light sources
- know that the moon is not a light source and can only be seen at night due to the reflection of the sun's light to earth
- recognise that light travels in a straight line, recognising how a periscope works
- identify the angle of reflection and angle of incidence on a diagram
- name ways to protect themselves from harmful rays of the sun, including sunglasses, sun cream, wearing clothes to cover the body and staying in the shade
- understand a shadow is formed when an opaque object is in front of a light source, noticing the further way the object is, the smaller the shadow
- define opaque as lets no light through, translucent as lets some light through and transparent as lets almost all the light through so things can be seen clearly

Procedural Knowledge

Pupils will:

- design their own experiments to investigate the path of light and how it interacts with different materials
- explore the properties of light, including the primary colours and how they combine to form different hues. They engage in activities such as using prisms to observe the dispersion of white light into its component colours
- investigate the relationship between the position of the light source, the object casting the shadow, and the resulting shadow
- formulate questions, make predictions, design experiment, collect and analyse data, and draw conclusions



Year 6

Term 3 - Electricity

Key Vocabulary:

Electricity, electric current, alternating current, direct current, battery, cell, bulb, wire, switch, motor, buzzer, circuit, voltage

Substantive Knowledge

Pupils will:

- recognise the correct symbols for components: bulb, cell, switch, buzzer, battery, voltmeter and ammeter
- identify the difference between a cell and a battery, a cell being a single unit containing two electrodes and an electrolyte and a battery being a collection of cells
- define current as the steady flow of electrons measured in amps and voltage as the force that makes the electric current flow which is measured in volts

Procedural Knowledge

Pupils will:

- apply knowledge of symbols to draw circuits accurately
- plan experiments to investigate the impact of voltage on a circuit and the effect of wire length, learning and applying principles of fair testing to ensure reliable and unbiased results
- change the voltage in a circuit to observe its effects, recording data and observations during the experiment
- systematically alter one variable (wire length) while keeping others constant
- present experimental results through tables, graphs, or charts, drawing conclusions based on observed data and patterns
- engage in collaborative experiments and discussions