

Topic	Benchmarks
Heat	<p>Applies knowledge from practical investigations to explain how heat is transferred by conduction, convection and radiation</p> <p>Establishes a link between heat loss in buildings and the temperature difference between the inside and outside of the building.</p> <p>Applies understanding of thermal energy efficiency, conductors and insulators to explain how design to reduce heat loss, for example, in double and triple glazing. materials can be used in building</p>
Cells	<p>Identifies the structures found in plant and animal cells and describes their functions.</p> <p>Describes the main similarities and differences between plant and animal cells.</p> <p>Researches and describes the structure and function of some specialised cells, for example, nerve, root hair, red blood cell, sperm and egg.</p> <p>Knows that DNA is found in the nucleus of most cells and that it contains the instructions for the development and function of living things (genetic code).</p> <p>Describes a gene as a piece of DNA which controls specific characteristics in an individual and demonstrates understanding that every individual has a unique combination of genes.</p>
Periodic Table	<p>Investigates and describes properties of metals and non-metals, for example, appearance, conductivity of electricity, position in the Periodic Table and their uses linked to their properties.</p> <p>Knows that elements are organised in the Periodic Table by atomic number, each with its own unique symbol, and that elements with similar chemical properties are placed together in vertical groups.</p> <p>Identifies and names the groups 'alkali metals', 'halogens' and 'noble gases' and describes their reactivity.</p> <p>Identifies elements present from simple molecular formulae.</p> <p>Investigates and explains how electricity can be produced when different metals are used as electrodes, with an electrolyte between them.</p> <p>Investigates and discusses the relationship between a range of factors (for example, the combination of metal electrodes used, the electrolyte used, the electrolyte concentration, the distance between electrodes and surface area of electrodes) and the voltage produced by a simple chemical.</p>

Forces

Draws on findings from investigations to explain how lubrication, streamlining and other methods can be used to reduce friction, reducing the energy lost and improving efficiency.

Knows that weight is a force caused by the Earth's (or other planet's) gravitational pull on an object, measured in newtons (N), and uses the formula $W = mg$ to calculate weight.

Predicts the effects on the weight of an object due to the gravitational field strength in different positions in the universe, for example, at different altitudes on Earth, on different planets and in deep space.

Matter

Describes, using particle models and diagrams, the properties of solids, liquids and gases and applies this knowledge to identify and classify unknown substances.

Applies understanding of models of matter to explain changes of state in terms of energy being gained or lost by a substance.

Gives examples of pure substances and mixtures from everyday life.

Selects appropriate physical methods to separate mixtures into their components, for example, distillation, filtration and chromatography and justifies their choices.

Investigates and describes the solubility of substances in different solvents, for example, water and acetone/propanone.

Body Systems

Explores and explains the structure and function of three of the major organ systems, for example, Respiratory, Circulatory and Digestive, and relates this to the basic biological processes required to sustain life.

Life on Other Planets

Presents a reasoned argument on the likelihood of life existing elsewhere in the universe including factors such as: the distance of planets from their stars, the number of stars in the universe and the availability of liquid water, nutrients and energy.