National Curriculum Key Stage 3 Science

TITLE	COVERED IN OLD SCHEME?	WHERE IS IT COVERED IN THE NEW OVERVIEW?	ANY EXAMPLE OF GOING BEYOND NC? (If relevant)
Pay attention to objectivity and concern for accuracy, precision, repeatability and reproducibility	Partial	Throughout Y7, 8 & 9 in Core Practical Tasks	
Understand that scientific methods and theories develop as earlier explanations are modified to take account of new evidence and ideas, together with the importance of publishing results and peer review	No	Homework Comprehension tasks	Pupils will do 10 minutes of reading in every lesson, sometimes focussing on scientific literature and academic papers
Evaluate risks	Yes	Throughout Y7, 8 & 9	
Ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience	Yes	Throughout Y7, 8 & 9	
Make predictions using scientific knowledge and understanding	Yes	Throughout Y7, 8 & 9	
Select, plan and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent and control variables, where appropriate	Yes	Throughout Y7, 8 & 9	
Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work, paying attention to health and safety	Yes	Throughout Y7, 8 & 9	
Make and record observations and measurements using a range of methods for different investigations; and evaluate the reliability of methods and suggest possible improvements	Yes	Throughout Y7, 8 & 9	
Apply sampling techniques	Yes	Throughout Y7, 8 & 9	

Apply mathematical concepts and calculate results	Yes	Throughout Y7, 8 & 9	
Present observations and data using appropriate methods, including tables and graphs	Yes	Throughout Y7, 8 & 9	
Interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions	Yes	Throughout Y7, 8 & 9	
Present reasoned explanations, including explaining data in relation to predictions and hypotheses	Yes	Throughout Y7, 8 & 9	
Evaluate data, showing awareness of potential sources of random and systematic error	Yes	Throughout Y7, 8 & 9	
Identify further questions arising from their results	Yes	Throughout Y7, 8 & 9	
Understand and use SI units and IUPAC (International Union of Pure and Applied Chemistry) chemical nomenclature	Yes	Throughout Y7, 8 & 9	
Use and derive simple equations and carry out appropriate calculations	Yes	Throughout Y7, 8 & 9	
Undertake basic data analysis including simple statistical techniques	Partial	Homework maths tasks	
cells as the fundamental unit of living organisms, including how to observe, interpret and record cell structure using a light microscope	Yes	Year 7 Term 1	
the functions of the cell wall, cell membrane, cytoplasm, nucleus, vacuole, mitochondria and chloroplasts	Yes	Year 7 Term 1	
the similarities and differences between plant and animal cells	Yes	Year 7 Term 1	
the role of diffusion in the movement of materials in and between cells	Yes	Year 7 Term 1	
the structural adaptations of some unicellular organisms	Yes	Year 7 Term 1	
the hierarchical organisation of multicellular organisms: from cells to tissues to organs to systems to organisms.	Yes	Year 7 Term 1	

the structure and functions of the human skeleton, to include support, protection, movement and making blood cells	No	Year 7 Term 1	
biomechanics – the interaction between skeleton and muscles, including the measurement of force exerted by different muscles	No	Year 7 Term 1	
the function of muscles and examples of antagonistic muscles.	No	Year 7 Term 1	
content of a healthy human diet: carbohydrates, lipids (fats and oils), proteins, vitamins, minerals, dietary fibre and water, and why each is needed	Yes	Year 8 Term 1	
calculations of energy requirements in a healthy daily diet	Yes	Year 8 Term 1	
the consequences of imbalances in the diet, including obesity, starvation and deficiency diseases	Yes	Year 8 Term 1	
the tissues and organs of the human digestive system, including adaptations to function and how the digestive system digests food (enzymes simply as biological catalysts)	Yes	Year 8 Term 1	
the importance of bacteria in the human digestive system	No	Year 8 Term 1	
plants making carbohydrates in their leaves by photosynthesis and gaining mineral nutrients and water from the soil via their roots.	Yes	Year 8 Term 3	
the structure and functions of the gas exchange system in humans, including adaptations to function	Yes	Year 8 Term 2	
the mechanism of breathing to move air in and out of the lungs, using a pressure model to explain the movement of gases, including simple measurements of lung volume	Yes	Year 8 Term 2	
the impact of exercise, asthma and smoking on the human gas exchange system	Partial	Year 8 Term 2	
the role of leaf stomata in gas exchange in plants	Yes	Year 8 Term 3	
reproduction in humans (as an example of a mammal), including the structure and function of the male and female reproductive systems, menstrual cycle (without details of hormones), gametes, fertilisation,	Yes	Year 7 Term 2	

gestation and birth, to include the effect of maternal lifestyle on the foetus through the placenta			
reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, including quantitative investigation of some dispersal mechanisms.	No	Year 7 Term 3	
the effects of recreational drugs (including substance misuse) on behaviour, health and life processes	No	Year 9 Term 2	
the reactants in, and products of, photosynthesis, and a word summary for photosynthesis	Yes	Year 8 Term 3	
the dependence of almost all life on Earth on the ability of photosynthetic organisms, such as plants and algae, to use sunlight in photosynthesis to build organic molecules that are an essential energy store and to maintain levels of oxygen and carbon dioxide in the atmosphere	Yes	Year 8 Term 3	
the adaptations of leaves for photosynthesis	Yes	Year 8 Term 3	
aerobic and anaerobic respiration in living organisms, including the breakdown of organic molecules to enable all the other chemical processes necessary for life	Yes	Year 8 Term 2	
a word summary for aerobic respiration	Yes	Year 8 Term 2	
the process of anaerobic respiration in humans and micro-organisms, including fermentation, and a word summary for anaerobic respiration	Yes	Year 8 Term 2	
the differences between aerobic and anaerobic respiration in terms of the reactants, the products formed and the implications for the organism	Yes	Year 8 Term 2	
the interdependence of organisms in an ecosystem, including food webs and insect pollinated crops	Yes	Year 7 Term 3	
the importance of plant reproduction through insect pollination in human food security	No	Year 7 Term 3	

how organisms affect, and are affected by, their environment, including the accumulation of toxic materials	Yes	Year 7 Term 3	
heredity as the process by which genetic information is transmitted from one generation to the next	Yes	Year 9 Term 1	
a simple model of chromosomes, genes and DNA in heredity, including the part played by Watson, Crick, Wilkins and Franklin in the development of the DNA model	Partial	Year 9 Term 1	
differences between species	Yes	Year 9 Term 1	
the variation between individuals within a species being continuous or discontinuous, to include measurement and graphical representation of variation	Yes	Year 9 Term 1	
the variation between species and between individuals of the same species means some organisms compete more successfully, which can drive natural selection	Yes	Year 9 Term 1	
changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction	Yes	Year 9 Term 1	
the importance of maintaining biodiversity and the use of gene banks to preserve hereditary material	No	Year 9 Term 1	
the properties of the different states of matter (solid, liquid and gas) in terms of the particle model, including gas pressure	Yes	Year 7 Term 1	
changes of state in terms of the particle model	Yes	Year 7 Term 1	
a simple (Dalton) atomic model	Yes	Year 7 Term 2	
differences between atoms, elements and compounds	Yes	Year 7 Term 2	
chemical symbols and formulae for elements and compounds	Yes	Year 7 Term 3	
conservation of mass changes of state and chemical reactions	Yes	Year 7 Term 3	
the concept of a pure substance	Yes	Year 7 Term 2	
mixtures, including dissolving	Yes	Year 7 Term 2	

diffusion in terms of the particle model	Yes	Year 7 Term 1	
simple techniques for separating mixtures: filtration, evaporation, distillation and chromatography	Yes	Year 7 Term 2	
the identification of pure substances	Yes	Year 7 Term 2	
chemical reactions as the rearrangement of atoms	Yes	Year 7 Term 3	
representing chemical reactions using formulae and using equations	Yes	Year 7 Term 3	
combustion, thermal decomposition, oxidation and displacement reactions	Yes	Year 7 Term 3	
defining acids and alkalis in terms of neutralisation reactions	Yes	Year 8 Term 2	
the pH scale for measuring acidity/alkalinity; and indicators	Yes	Year 8 Term 2	
reactions of acids with metals to produce a salt plus hydrogen	Yes	Year 8 Term 2	
reactions of acids with alkalis to produce a salt plus water	Yes	Year 8 Term 2	
what catalysts do	Yes	Year 7 Term 3	
energy changes on changes of state (qualitative)	Yes	Year 7 Term 1	
exothermic and endothermic chemical reactions (qualitative)	Yes	Year 7 Term 3	
the varying physical and chemical properties of different elements	Yes	Year 8 Term 1	
the principles underpinning the Mendeleev Periodic Table	Yes	Year 8 Term 1	
the Periodic Table: periods and groups; metals and non-metals	Yes	Year 8 Term 1	
how patterns in reactions can be predicted with reference to the Periodic Table	Yes	Year 8 Term 1	
the properties of metals and non-metals	Yes	Year 8 Term 1	
the chemical properties of metal and non-metal oxides with respect to acidity	Yes	Year 8 Term 3	
the order of metals and carbon in the reactivity series	Yes	Year 8 Term 3	
the use of carbon in obtaining metals from metal oxides	Yes	Year 9 Term 1	
properties of ceramics, polymers and composites (qualitative)	No	Year 9 Term 1	

the composition of the Earth	No	Year 9 Term 2	
the structure of the Earth	No	Year 9 Term 2	
the rock cycle and the formation of igneous, sedimentary and metamorphic rocks	No	Year 9 Term 2	
Earth as a source of limited resources and the efficacy of recycling	Partial	Year 9 Term 2	
the carbon cycle	Yes	Year 9 Term 3	
the composition of the atmosphere	Yes	Year 9 Term 2	How the earth's atmosphere has changed over time.
the production of carbon dioxide by human activity and the impact on climate	Yes	Year 9 Term 2	Other atmospheric pollutants and greenhouse gases and how acid rain is produced. Climate change and how the effect can be reduced.
comparing energy values of different foods (from labels) (kJ)	Yes	Year 8 Term 1	
comparing power ratings of appliances in watts (W, kW)	No	Year 7 Term 2	
comparing amounts of energy transferred (J, kJ, kW hour)	No	Year 7 Term 2	
domestic fuel bills, fuel use and costs	No	Year 7 Term 3	
fuels and energy resources.	Partial	Year 7 Term 2	
simple machines give bigger force but at the expense of smaller movement (and vice versa): product of force and displacement unchanged	Yes	Year 7 Term 2	
heating and thermal equilibrium: temperature difference between two objects leading to energy transfer from the hotter to the cooler one, through contact (conduction) or radiation; such transfers tending to reduce the temperature difference: use of insulators	Yes	Year 8 Term 2	
other processes that involve energy transfer: changing motion, dropping an object, completing an electrical circuit, stretching a spring, metabolism of food, burning fuels.	Yes	Year 7 Term 2	

energy as a quantity that can be quantified and calculated; the total energy has the same value before and after a change	Yes	Year 7 Term 2	
comparing the starting with the final conditions of a system and describing increases and decreases in the amounts of energy associated with movements, temperatures, changes in positions in a field, in elastic distortions and in chemical compositions	Partial	Year 7 Term 2 & Year 8 Term 2	
using physical processes and mechanisms, rather than energy, to explain the intermediate steps that bring about such changes	No	Year 7 Term 2 & Term 3. Year 8 Term 1 & 2	
speed and the quantitative relationship between average speed, distance and time (speed = distance ÷ time)	Yes	Year 9 Term 1	
the representation of a journey on a distance-time graph	Yes	Year 9 Term 1	
relative motion: trains and cars passing one another	No	Year 9 Term 1	
forces as pushes or pulls, arising from the interaction between two objects	Yes	Year 7 Term 2	
using force arrows in diagrams, adding forces in one dimension, balanced and unbalanced forces	Yes	Year 7 Term 2	
moment as the turning effect of a force	No	Year 9 Term 1	
forces: associated with deforming objects; stretching and squashing – springs; with rubbing and friction between surfaces, with pushing things out of the way; resistance to motion of air and water	Yes	Year 7 Term 2	
forces measured in newtons, measurements of stretch or compression as force is changed	Yes	Year 7 Term 2	
force-extension linear relation; Hooke's Law as a special case	Yes	Year 7 Term 2	
work done and energy changes on deformation	No	Year 9 Term 1	
non-contact forces: gravity forces acting at a distance on Earth and in space, forces between magnets and forces due to static electricity	Yes	Year 7 Term 2	
atmospheric pressure, decreases with increase of height as weight of air above decreases with height	Partial	Year 9 Term 1	

pressure in liquids, increasing with depth; upthrust effects, floating and sinking	Yes	Year 9 Term 1	
pressure measured by ratio of force over area – acting normal to any surface	Yes	Year 9 Term 1	
opposing forces and equilibrium: weight held by stretched spring or supported on a compressed surface	Yes	Year 7 Term 2	
forces being needed to cause objects to stop or start moving, or to change their speed or direction of motion (qualitative only)	Yes	Year 7 Term 2	
change depending on direction of force and its size	Yes	Year 7 Term 2	
waves on water as undulations which travel through water with transverse motion; these waves can be reflected, and add or cancel – superposition	No	Year 8 Term 1	
frequencies of sound waves, measured in hertz (Hz); echoes, reflection and absorption of sound	Yes	Year 8 Term 1	
sound needs a medium to travel, the speed of sound in air, in water, in solids	Yes	Year 8 Term 1	
sound produced by vibrations of objects, in loud speakers, detected by their effects on microphone diaphragm and the ear drum; sound waves are longitudinal	No	Year 8 Term 1	
auditory range of humans and animals	Yes	Year 8 Term 1	
pressure waves transferring energy; use for cleaning and physiotherapy by ultra-sound; waves transferring information for conversion to electrical signals by microphone.	No	Year 8 Term 1	
the similarities and differences between light waves and waves in matter	Yes	Year 8 Term 1	
light waves travelling through a vacuum; speed of light	Yes	Year 8 Term 1	
the transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface	Yes	Year 8 Term 1	

use of ray model to explain imaging in mirrors, the pinhole camera, the refraction of light and action of convex lens in focusing (qualitative); the human eye	No	Year 8 Term 1	
light transferring energy from source to absorber leading to chemical and electrical effects; photo-sensitive material in the retina and in cameras	No	Year 8 Term 1	
colours and the different frequencies of light, white light and prisms (qualitative only); differential colour effects in absorption and diffuse reflection	Yes	Year 8 Term 1	
electric current, measured in amperes, in circuits, series and parallel circuits, currents add where branches meet and current as flow of charge	Yes	Year 7 Term 3	
potential difference, measured in volts, battery and bulb ratings; resistance, measured in ohms, as the ratio of potential difference (p.d.) to current	Yes	Year 7 Term 3	
differences in resistance between conducting and insulating components (quantitative)	Partial	Year 7 Term 3	
separation of positive or negative charges when objects are rubbed together: transfer of electrons, forces between charged objects	Yes	Year 9 Term 2	
the idea of electric field, forces acting across the space between objects not in contact	Yes	Year 9 Term 2	
magnetic poles, attraction and repulsion	Yes	Year 9 Term 2	
magnetic fields by plotting with compass, representation by field lines	Yes	Year 9 Term 2	
Earth's magnetism, compass and navigation	Yes	Year 9 Term 2	
the magnetic effect of a current, electromagnets, D.C. motors (principles only)	Yes	Year 9 Term 2	
conservation of material and of mass, and reversibility, in melting, freezing, evaporation, sublimation, condensation, dissolving	Yes	Year 7 Term 1 & 2	

similarities and differences, including density differences, between solids, liquids and gases	Yes	Year 7 Term 1	
Brownian motion in gases	Yes	Year 7 Term 1	
diffusion in liquids and gases driven by differences in concentration	Yes	Year 7 Term 1	
the difference between chemical and physical changes	Yes	Year 7 Term 3	
the differences in arrangements, in motion and in closeness of particles explaining changes of state, shape and density, the anomaly of ice-water transition	Partial	Year 7 Term 1	
atoms and molecules as particles	Yes	Year 7 Term 2	
changes with temperature in motion and spacing of particles	Yes	Year 8 Term 2	
internal energy stored in materials	Yes	Year 8 Term 2	
gravity force, weight = mass x gravitational field strength (g), on Earth g=10 N/kg, different on other planets and stars; gravity forces between Earth and Moon, and between Earth and Sun (qualitative only)	Yes	Year 8 Term 3	
our Sun as a star, other stars in our galaxy, other galaxies	Yes	Year 8 Term 3	
the seasons and the Earth's tilt, day length at different times of year, in different hemispheres	Yes	Year 8 Term 3	
the light year as a unit of astronomical distance	No	Year 8 Term 3	