

Year 8 Scheme of Work

Units DEJ will be completed between May and July, then the next units will begin

Units ABCFGKL will be completed by January

Biology in year 8

8A Food, glorious food

Topic 8Aa starts by introducing the idea that health experts are worried about the effects of unhealthy diets on children, and the role that advertising plays in this. There is revision of what a diet is and the various food substances found in foods, including how to test for them.

Topic 8Ab extends knowledge from 8Aa, considering the ideas of a balanced diet, the components of food and their uses, and the energy content of foods.

Topic 8Ac covers digestion, the organs involved and the role of enzymes. The material covers teeth, extending ideas that pupils will have met in KS2.

Topic 8Ad considers enzyme activity in more detail and work covers the roles of the liver and pancreas in digestion.

Topic 8Ae looks at the absorption of digested food in the small intestine and how the food substances are transported around the body to where they are required

8B Going for gold

Topic 8Ba starts by looking at the range of careers in sports made available to students who carry on their scientific studies. There is a look at how our knowledge of respiration has developed over time and the topic also reinforces the concept of digestion. Glucose is introduced as an important molecule in providing energy for the body and respiration compared to burning. The word equation for respiration is introduced.

Topic 8Bb looks at how substances are transported around the body in the blood and the structure of the circulatory system.

Topic 8Bc links aerobic respiration to exercise and discusses some effects on the body of an inadequate blood supply. The supply of oxygen and removal of carbon dioxide from respiring cells is dealt with.

Topic 8Bd covers the structure of the lungs and gas exchange. The effects of lung damage are introduced; smoking is covered in more detail in Unit 9B.

Topic 8Be compares inhaled and exhaled air, theoretically and by experiment. Gas exchange in aquatic organisms is discussed. The work is concluded with a look at some ways in which athletes cheat.

8C Doctors and diseases

Topic 8Ca is divided into two main parts. The first covers the work of doctors and nurses and the importance of cleanliness in hospitals. The second covers what microbes are.

Topic 8Cb covers the various uses for microbes, focusing attention on baking and brewing. The idea of population sizes is also revisited (from Unit 7D) and extended.

Topic 8Cc covers human infectious diseases caused by microbes and how they are spread.

Topic 8Cd looks at how the spread of disease is controlled today and the body's natural defences. The work of Louis Pasteur is considered.

Topic 8Ce looks at immunity and immunisation and the role played by modern medicine in the treatment of diseases. The work of Edward Jenner and Alexander Fleming is considered, together with a look at the applications and implications of using antibiotics in the context of 'superbugs'.

8D The way of the dodo

Topic 8Da looks at some examples of extinct organisms to provide revision on habitats and animal classification. It also provides an introduction to plant classification.

Topic 8Db introduces a wide range of different sampling methods that allow us to find out about communities, population sizes and distribution. It also considers how fossils can provide evidence about communities and populations.

Topic 8Dc looks at physical environmental factors in a habitat, how they are measured and their effects on the organisms. This is contrasted with a look at how scientists work out what environments used to be like, using rocks, ice cores and fossils.

Topic 8Dd introduces the effects of living factors in a habitat and the interrelationships between the different organisms in a habitat. Food chains and webs are revisited.

Topic 8De introduces pyramids of numbers and the effects of toxic chemicals on food webs.

Chemistry in year 8

8E In the drink

Topic 8Ea introduces the idea that the water we get from our taps has to be treated to make it clean, and then revisits mixtures and dissolving, which pupils will have met in KS2.

Topic 8Eb looks at the particle model of matter to explain dissolving, filtering and the conservation of mass, and then looks at saturated solutions, and the effect of temperature on solubility.

Topic 8Ec focuses on the evaporation of water from solutions and the process used to do this in the laboratory, and also how this is applied to the production of salt from brine.

Topic 8Ed focuses on chromatography and its applications.

Topic 8Ee looks at distillation, including an explanation of why it works in terms of particles. The unit finishes with a discussion of whether and how we should conserve water supplies in the UK.

8F Materials and recycling

Topic 8Fa starts with an introduction to recycling. A brief history of some of the common materials develops the idea that there is a class of simple substances, called elements, from which all the substances in the world are made. A chemical element is based on the properties of the material.

Topic 8Fb extends Year 7 work on particle theory and applies it to elements. At this level all atoms of an element are treated as identical. International codes are introduced in the context of plastics reprocessing and this is related to chemical symbols. Atoms are defined as the smallest particle of an element that can exist.

Topic 8Fc builds on Year 7 work to develop the idea of properties, and summarises the main differences between metals and non-metals. The position of metals and non-metals in the periodic table is discussed based on observable physical properties.

Topic 8Fd introduces compounds, using examples chosen to link with the unit theme. Pupils are introduced to molecules, chemical formulae and the naming of binary compounds.

Topic 8Fe looks at the recycling of glass, paper, plastics and aluminium. The distinction between re-using and recycling is emphasised, and pupils are introduced to concepts of sustainable development and renewable resources. The unit concludes with a debate on schemes for waste management.

8G All that glitters

Topic 8Ga uses examples of substances used in jewellery making (e.g. gold, diamond) to introduce the difference between elements and compounds at a macroscopic and particle level. Simple formulae are also introduced, including for the oxides of certain elements and the acids met in Unit 7E. The formation of compounds is exemplified by the reaction of iron and sulphur.

Topic 8Gb develops the idea of chemical and physical changes. A number of changes are studied: in some cases the chemicals react just by mixing together (precipitation reactions), whereas in others heat is required (decomposition reactions).

Topic 8Gc introduces the idea of mixtures as another class of substances other than elements and compounds. Natural water, seawater and air are the contexts for explaining the distinction.

Topic 8Gd looks at the alloys used in jewellery making as examples of mixtures and how the properties of elements can be changed by mixing them with other substances.

Topic 8Ge builds on previous work on changes of state to establish that a definite melting or boiling point is a criterion for deciding whether something is pure or not. Ice/salt and water/salt mixtures and solder are used as examples of mixtures that have melting and boiling points different from the pure elements or compounds from which they are made.

8H Explaining the Earth

Topic 8Ha reviews some of the ideas and words met in Unit 7H to consolidate pupils' learning about the processes involved in the formation of sedimentary rock. It also looks at what kinds of evidence can be found in sedimentary rocks for how they were formed, or for finding out about past climates or living organisms.

Topic 8Hb examines igneous rocks and how their cooling rate leads to different crystal sizes. It looks at their features such as basalt columns, and rocks formed from volcanic fragments.

Topic 8Hc focuses on the idea of metamorphism and the processes by which rock of one type can be changed into a new form. Various models illustrate the processes, and metamorphic rocks are compared to the rocks from which they were formed.

Topic 8Hd outlines theories that have been used to explain the formation of rocks and where they can be found. Evidence is presented for and against different theories. The concept of geological time is also introduced.

Topic 8He draws together the content of the previous topics by considering the rock cycle as a summary of the processes studied so far.

Physics in year 8

8I Heat transfers

Topic 8Ia considers the difference between heat and temperature, and reminds pupils that heat energy is always passed from a hotter to a cooler object. Could level work looks at specific heat capacity, and at the Kelvin temperature scale and the concept of absolute zero.

Topic 8Ib discusses the conduction of heat and its explanation in terms of particles, and how insulation materials such as down jackets work. Could level work looks at some of the adaptations of penguins to living in a cold environment.

Topic 8Ic looks at convection and explains how convection currents form as a result of density changes. It applies this to the use of trapped air for insulation, and why warm clothing should not be too baggy. The topic also considers some uses of convection.

Topic 8Id looks at the energy changes connected with changes of state, including why sweating helps to cool us down and the use of wicking garments and breathable fabrics.

Topic 8Ie introduces radiation and asks pupils to investigate why fire fighters or vulcanologists sometimes wear silvery suits. The unit concludes by asking pupils to consider the effect that modern clothing technology may have on the environment, in terms of making it possible for tourists to visit places like Antarctica that were previously only accessible to a few hardy explorers.

8I On the move

Topic 8Ja introduces the theme of the unit by looking at different forms of transport and how we use them, and then goes on to look at the cause of drag and how it can be reduced. Practical work is based on investigating the drag of different shapes.

Topic 8Jb looks at forces applied over large and small areas in the context of tracked vehicles and railways, and also looks at the application of high pressure in more everyday items such as knives.

Topic 8Jc looks at maglev trains as a way of revising KS2 work on magnets and magnetism. It introduces electromagnets, and the rules for attraction and repulsion between the ends of magnets. The application of electromagnets in bells, relays and circuit breakers is also considered.

Topic 8Jd looks at the idea of magnetic fields, in the context of the use of compasses for navigation. Practical work involves finding the shape of magnetic fields of a magnet or of combinations of magnets.

Topic 8Je looks at the turning effect of forces in the context of controlling the attitude of aircraft and in more domestic contexts. Practical work on levers is included.

8L Light fantastic

Topic 8Ka starts by revising the fact that we see things when light enters our eyes, and looks at some historical ideas about light and attempts to measure its speed. Practical work is based on investigating the factors that affect the size of a shadow.

Topic 8Kb revises the fact that light can pass through some materials but not others. It goes on to explain how pinhole cameras work and links this to how the eye works.

Topic 8Kc begins with a comparison between the way light is reflected by rough and smooth surfaces and then explores the way light is reflected in a plane mirror. The law of reflection is introduced and investigated in the practical work

Topic 8Kd looks at refraction in the context of camera lenses, and then develops these ideas via practical work.

Topic 8Ke looks at dispersing white light using prisms, making coloured light using filters and how coloured objects look in different coloured light. The unit concludes by discussing the different uses of images in society, and asking

pupils to debate their usefulness.

8L Sound

Topic 8La introduces the nature of sound with a particular focus on bats and how they use ultrasound to 'see'. The terms 'intensity' and 'pitch' are introduced.

Topic 8Lb covers the units for measuring frequency and the use of an oscilloscope for displaying sound waves. The loudness and amplitude of notes are introduced, and the term wavelength.

Topic 8Lc compares differences between the properties of light and sound. The particle model is developed to explain the variation of the speed of sound travelling through different materials.

Topic 8Ld looks at how the ear works, and then looks at temporary and permanent damage to the ear.

Topic 8Le concentrates on noise and how it is measured. The threshold of hearing is discussed and a decibel scale is introduced.