

SCIENCE

The programme of study builds on that of year 7 and there is a continuing development in the areas of literacy, numeracy, ICT, key skills and thinking skills. The schemes of work also provide many opportunities for pupils to carry out scientific investigations and to learn about the importance of experimental evidence in supporting scientific ideas. The content is covered in the four areas of scientific enquiry Sc1, life processes and living things (Sc2), materials and their properties (Sc3) and physical processes (Sc4). During the year pupils will be assessed as they learn and through end of topic tests.

The following topics will be taught in a cycle



8A Food and Digestion (Sc2)

In this unit pupils :

- learn about different foods and how they can be combined to produce a balanced diet
- learn how food is broken down by digestion so it can be used by the body for energy, growth and repair.

In scientific enquiry (which focuses on investigative skills) pupils:

- consider the extent to which evidence about diet can lead to firm conclusions
- use a model to explore digestion
- use chemical tests to identify food types

8B Respiration (Sc2)



In this unit pupils:

- learn how cells are supplied with the materials they need for respiration
- learn how cells in animals and plants release energy
- learn that the process of respiration is similar in all cells

In scientific enquiry pupils:

- consider earlier ideas about circulation including how and why these ideas have changed and developed
- consider how to deal with factors that cannot be controlled when working with living materials

8C Microbes and Disease (Sc2)

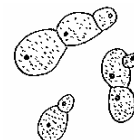
In this unit pupils:

- learn that micro-organisms share the characteristics of living things
- learn how we grow micro-organisms to make products eg yogurt and the role of micro-organisms in infectious disease
- understand the body's defence systems and how immunisations can protect against microbial infections



In scientific enquiry pupils:

- consider how ideas about the transmission of infectious diseases have changed and are continuing to develop
- learn how scientists work together to investigate and reduce the transmission of infectious disease
- learn how to grow micro-organisms healthily and safely
- investigate the activity of yeast, evaluating proposed approaches



8E Atoms and Elements (Sc3)

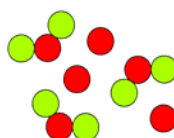
In this unit pupils :

- learn that the huge range of materials is made from a relatively small number of elements
- learn that each element is made from one sort of atom
- learn about the characteristics/behaviour of some elements
- discover how the particle model is used to describe what happens when elements combine

In scientific enquiry pupils:

- model differences between particles in elements and non-elements
- organise and sequence information from secondary sources
- choose an approach to find out whether a substance is an element or not

8F Compounds and Mixtures (Sc3)

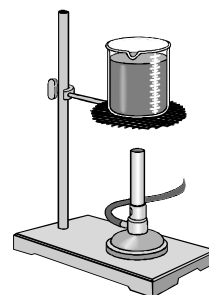
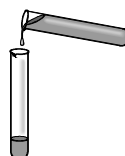


In this unit pupils:

- distinguish between elements and compounds and learn how they are represented by symbols and formulae
- describe chemical changes as a process in which atoms join together in new ways
- distinguish between compounds and mixtures
- distinguish between chemical reactions in which new compounds are formed and the formation of mixtures

In scientific enquiry pupils:

- investigate temperature changes as liquids cool



Unit 7C Environment and Feeding Relationships

In this unit pupils learn:

- how habitats vary
- how plants and animals are adapted to live in a particular habitat

- how plants and animals interact with their environment and with each other, including feeding relationships
- about adaptations for feeding
- how to link food chains to make webs.

In scientific enquiry pupils:

- consider the importance of sample size, make measurements of environmental changes and interpret these
- consider features of animals and plants which help their survival.



Unit 8D Ecological Relationships (Sc2)

In this unit pupils:

- learn how how organisms can be identified and sizes of populations compared
- learn how feeding relationships can be modelled quantitatively
- learn how living things within a community influence each other and are affected by the environment

In scientific enquiry pupils:

- learn how to sample in biological investigations
- collect, present and interpret data and use this to make predictions
- undertake fieldwork to collect information about organisms within a habitat

8I Heating and Cooling (Sc4)

In this unit pupils:

- recognise the need for a temperature scale
- distinguish between heat (as energy) and temperature
- learn about the different ways in which heat is transferred-conduction, convection, radiation and apply these to familiar contexts
- learn about expansion and change of state in solids, liquids and gases
- use the particle model to explain conduction, convection and change of state

In scientific enquiry pupils:

- carry out a survey of people's perceptions of common temperatures
- investigate the effectiveness of different forms of insulation, controlling relevant variables.

7J Electrical Circuits

In this unit pupils:

- consolidate and extend their ideas about circuits;
- use concepts of electric current and energy transfer to explain the working of circuits;
- explain patterns in the measurements of current and voltage;
- use of the concept of resistance qualitatively;
- build circuits in which current flow is usefully controlled;
- consider the hazards of electricity for humans.

In scientific enquiry pupils:

- recognize hazards and take safety precautions when planning work.

8J Magnets and electromagnets (Sc4)

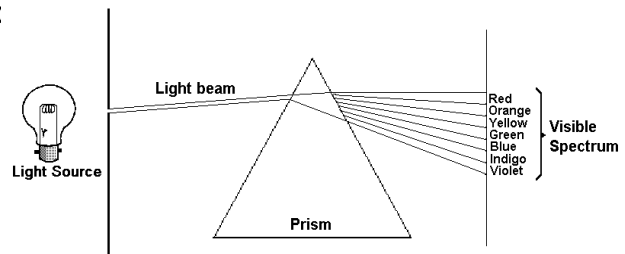


In this unit pupils:

- identify magnetic materials, make a magnet and test the strength of a magnet
 - use the concept of a magnetic field, of a permanent magnet and an electromagnet
 - learn about the factors affecting the strength of an electromagnet
- explain the working of a number of devices that use magnets and electromagnets

In scientific enquiry pupils:

- use scientific knowledge and understanding to make predictions about the behaviour of magnets and magnetic material
- investigate the strength of an electromagnet, controlling relevant variables and evaluating the limitations of the data (



8K Light (Sc4)

In this unit pupils:

- build on experiences of light and its effects
- explain how we see objects
- represent light as a ray and use this in explaining reflection and refraction
- learn about the origin of coloured light, the effects of filters and coloured objects

In scientific enquiry pupils:

- consider why the spectrum described by Newton has seven colours
- make and test predictions about the path of light
- measure and record angles
- identify and make predictions from patterns in data



- investigate reflection and refraction at a plane surface
- investigate the effects of coloured light on the appearance of objects

8L Sound and Hearing (Sc4)

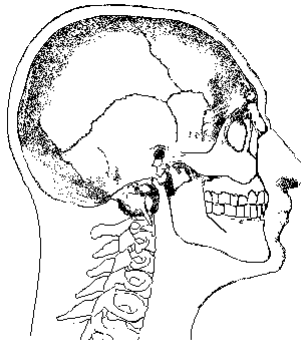


In this unit pupils:

- build on experiences of sound and hearing
- learn about how sound travels through media eg. solids, gases
- learn how the ear works, the harmful effects of loud noise, how this can be reduced

In scientific enquiry pupils:

- investigate the loudness of sounds using an appropriate strategy



9C Plants and photosynthesis (Sc2)

In this unit pupils learn:

- about photosynthesis as the key process producing new plant biomass
- that the carbon dioxide for photosynthesis comes from the air and that the water is absorbed through the roots
- that chlorophyll enables a plant to utilise light in photosynthesis
- about the role of the leaf in photosynthesis
- about the importance of photosynthesis to humans and other animals

In scientific enquiry pupils:

- consider how knowledge about the gases in the air has led to development of ideas about photosynthesis
- interpret data and graphs using scientific knowledge and understanding

- investigate photosynthesis in pond weed, controlling relevant variables

9D Plants for food (Sc2)

In this unit pupils:

- learn about humans as part of a complex food web
- learn about factors affecting plant growth
- learn how management of food production has many implications for other animal and plant populations in the environment
- consider some of the issues involved in sustainable development of the countryside



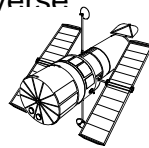
In scientific enquiry pupils:

- investigate the effects of fertiliser on plant growth
- survey weeds growing in a habitat, using an appropriate sampling technique

9J Gravity and space (Sc4)

In this unit pupils:

- learn about the gravitational pull between bodies; how it depends on the masses of bodies and the distance between them
- relate the movement of planets around the Sun, and that of satellites around the Earth, to gravitation
- study how artificial satellites are used to observe the Earth and provide information about the solar system and the universe
- find out about space exploration

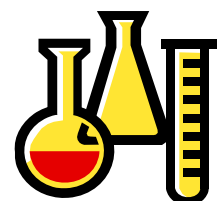


In scientific enquiry pupils:

- consider different views of the nature of the solar system and evaluate them against relevant evidence
- discover how scientists work together to gather and interpret evidence from space
- make predictions from patterns in data

Home work tasks throughout the year will include the following activities:

- Research using a range of resources
- Presentation of ideas using posters, leaflets, Power Point, video
- Answering questions



- Presenting and analysing data
- Making models
- Writing articles, poems,
- Planning and writing up experiments/investigations
- Finding out about the work of scientists
- Learning key words and meanings
- Revising work for tests