

# SCIENCE

During the year the pupils will complete the Key Stage 3 programmes of study which cover scientific enquiry (Sc1), life processes and living things (Sc2), materials and their properties (Sc3) and physical processes (Sc4). Pupils' performance in these sections will provide evidence for the end-of-key-stage teacher assessment. As in years 7 and 8 there will be 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.

In the Summer term students will be engaged in tasks that improve their skills of scientific enquiry to prepare them for their GCSE course in year 10. Details of the curriculum can be found at [http://www.standards.dfes.gov.uk/schemes2/secondary\\_science/](http://www.standards.dfes.gov.uk/schemes2/secondary_science/)

The following topics are taught in a cycle:

## **9A Inheritance and selection (Sc2)**



In this unit pupils learn:

- that characteristics are inherited and how this is used in selective breeding
- why selective breeding is important
- about variations arising from environmental differences

In scientific enquiry pupils:

- collect, organise and use large data sets relating to variation

## **9B Fit and healthy (Sc2)**



In this unit pupils learn:

- how the human respiratory, digestive and circulatory systems interact to maintain activity
- about the functions of the skeleton
- about ways in which diet, exercise, smoking and drugs affect health

In scientific enquiry pupils:

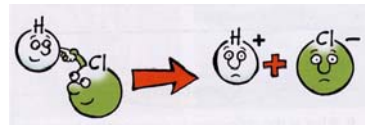
- find out how scientists linked diseases to a lack of specific nutrients
- consider how the work of different scientists has contributed to a medical advance
- evaluate conflicting evidence



- investigate reaction time, considering how factors which cannot be controlled can be taken into account

### **9E Reactions of metals and metal compounds (Sc3)**

In this unit pupils:

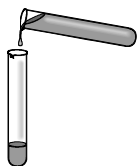


- explore the properties of metals and non-metals
- learn that different acids react in similar ways with metals, with metal carbonates and with metal oxides
- represent elements by symbols and compounds by formulae
- use word and symbol equations to describe these reactions

In scientific enquiry pupils:

- describe patterns in qualitative data about reactions
- use patterns in reactions to make predictions about other reactions
- devise and evaluate a method for preparing a sample of a specified salt

### **9F Patterns of reactivity (Sc3)**



In this unit pupils:

- learn that although metals react in a similar way with oxygen, water and acids, some react more readily than others
- establish and use a reactivity series for metals
- represent chemical reactions by word and/or symbol equations

In scientific enquiry pupils:

- use a proposed reactivity series to make predictions
- investigate the relative reactivity of different metals, identifying and controlling relevant variables

### **9G Environmental chemistry (Sc2)**

In this unit pupils:

- learn that rocks, soils and building materials have a variety of chemical characteristics

- learn that chemical weathering alters rocks and building materials over time
- consider how the atmosphere and water resources are affected by natural processes and the activity of humans
- consider how environmental conditions are monitored and controlled
- distinguish between different environmental issues



In scientific enquiry pupils:

- consider how scientists work to monitor the environment
- consider how evidence for climate and environmental change needs careful interpretation
- evaluate the evidence obtained
- investigate environmental change using evidence from secondary sources

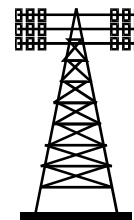
### **9H Using chemistry (Sc3)**



In this unit pupils:

- find out more about how chemical reactions can be used as an energy source
- consider how chemical reactions are used to make new materials
- model chemical reactions as the rearrangement of atoms, and use the model to explain that matter is not lost
- represent chemical reactions by word and/or symbol equations

### **9I Energy and electricity (Sc4)**



In this unit pupils:

- explore a range of useful energy transfers and transformations
- discuss the use of electricity as a convenient way to transfer energy to do useful things
- associate the concept of voltage with the transfer of energy in a circuit
- investigate the voltage of cells
- study how electricity is generated, with reference to environmental impacts
- use the principle of conservation of energy to identify ways in which energy is dissipated during transfers

In scientific enquiry pupils:

- use models to explain observations relating to electric currents

- measure voltage in circuits
- identify patterns in the measurements of voltage in series circuits and use these to draw conclusions

## 9K Speeding up (Sc4)



In this unit pupils:

- use the concept of speed
- consider the relationship between forces (including balanced forces) on an object, and its movement
- study the effects of water and air resistance on speed, and how streamlining reduces these effects
- use ideas of balanced and unbalanced forces to explain the movement of falling objects

In scientific enquiry pupils:

- measure and calculate, with appropriate precision, the speed of objects in a range of situations
- consider a range of techniques for measuring time and evaluate their relative accuracy and appropriateness for different situations
- construct and interpret speed-time graphs, describing patterns or relationships

## 9L Pressure and moments (Sc4)

In this unit pupils:

- study pressure on solids and describe applications of this in everyday appliances
- study hydrostatic pressure in fluids and describe an application, *eg hydraulic jack*
- describe the operation of levers, including examples from the human body, which depend on the turning effect of a force
- learn about the principle of moments



In scientific enquiry pupils:

- investigate balance about a pivot, evaluating strengths and weaknesses in their methods

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 using scientific terms
- ✓ Writing articles for specific audiences
- ✓ Planning and evaluating experiments/investigations
- ✓ Learning key scientific words and meanings
- ✓ Learning key facts
- ✓ Designing revision aids:      writing concept maps  
   making revision cards  
   Sequencing information

