



## A Guide to the Curriculum at Key Stage 3 (Years 7, 8 & 9)

### Science

The Year 7 course is part of the Key Stage 3 (Years 7 – 9) Science course, Activate, which is designed to spark students' interest in Science and support them on their journey through KS3 to KS4 success. It is designed to meet the requirements of the 2014 curriculum, providing opportunity for effective differentiation and assessment throughout. Support and extension is provided for every lesson, with differentiated questions, support sheets, and extension tasks. End-of-chapter checkpoints provide further support and extension. Activate is accompanied by Kerboodle, providing online resources to support each lesson and homework activities.

The Year 7 Units are worked through on a rota system to allow for the effective use of resources. Each teaching group will have completed the same units by the end of each academic year.

#### Year 7

##### Working Scientifically

Working Scientifically was new to the 2014 Key Stage 3 Programme of Study and the new GCSE criteria. It is divided into four areas; scientific attitudes; experimental skills and investigations; analysis and evaluation, and measurement.

Students begin Year 7 with a short unit which introduces them specifically to some of the skills required throughout their Science study. After this, the skills are integrated into the teaching and learning of Biology, Chemistry and Physics.

##### Biology Unit 1

Cells – Students are given the opportunity to observe cells. They learn to describe the structure and function of both typical and specialised cells. They also consider adaptations of unicellular (made up of one cell only) organisms which allow them to survive.

Structure and function of body systems – Students learn how the structure of living things can be organised into levels and how to define each level. They then consider specific body systems, their functions and how they are adapted to carry out these functions.

Reproduction – Students learn about sexual reproduction in both humans and plants. They have opportunity to discuss issues linked to adolescence and puberty; they also learn the structures and organs involved in fertilisation, gestation and birth.

##### Chemistry Unit 1

Particles and their behaviour – Students consider familiar ideas such as changes of state and learn to explain them using ideas about particle arrangement and energy in substances.

Elements, atoms, and compounds – Students learn how substances are classified according to the atoms they contain. They have opportunity to learn how to represent different substances using chemical nomenclature (the way that chemicals are named), symbols and formulae.

Reactions – Students consider chemical changes in familiar and unfamiliar contexts describing them in terms of conservation of mass and energy.

### **Physics Unit 1**

Forces – Students investigate the effects of forces on objects and learn to describe forces working in different situations.

Sound – Students learn about different types of waves. They then apply this learning in order to describe and explain the properties of different sound waves.

Light – Students consider properties of light and how it interacts with different substances. They learn the basic structure of the eye and the functions of its different parts. These are then compared to a camera.

## **Year 8**

### **Chemistry Unit 1**

Acids and Alkalis – Students investigate properties and reactions of acids and alkalis, considering where these reactions are useful in everyday situations.

### **Physics Unit 1**

Space – Students learn about the positions and movement of objects within our Solar System. They consider the Solar System as part of the wider Universe.

### **Biology Unit 2**

Health and Lifestyle – Students learn about the nutrients required in a healthy diet and how the digestive system works. They will learn about enzymes and their function both in the human body and industry. They consider other factors which can have an impact upon health and fitness.

Ecosystem processes – Students consider the interdependence of all living things in terms of how biomass is produced, distributed through food chains and webs, and used for energy.

### **Chemistry Unit 2**

The Periodic Table – Students learn about the organisation of different types of elements within the Periodic Table. They are introduced to simple patterns of reactivity and common reactions and products.

Separation techniques – Students investigate different ways of obtaining specific elements and compounds from mixtures.

Metals and acids – Chemical properties of metals and metal compounds are investigated. This then leads to a consideration of suitability of substances for various uses and some alternative materials which may be available.

### **Physics Unit 2**

Electricity and magnetism – Students investigate the properties of series and parallel circuits. They learn how current can be used to induce a magnetic field and then investigate the effects of magnetic fields.

Energy – Students learn about different energy sources and resources. They investigate and explain different types of energy transfer. They then consider and quantify energy used in terms of work and power.

## **Year 9**

### **Biology**

Adaptation, variation and Inheritance – Students consider how species evolve and either adapt for survival or become extinct. They will consider the process of inter-specific and intra-specific competition, variation and adaptation.

Life processes and microbiology – Students study cell organelle structure and function. They will learn about different forms of microscopy, including practical applications in the medical industry.

### **Chemistry**

The Earth – Students consider the general composition of the Earth and its atmosphere. They study how materials and energy can be cycled within these environments and the factors, particularly with human influences, which may affect this movement.

Chemical Reactions - Students discover which factors affect rates of reaction. They will learn about the practical and financial implications of these conditions and their effect on product yield.

Patterns of Reactivity – Students consider how the relative reactivity of elements affects their uses in commerce and industry. They will gain practical experience of displacement and oxidation reactions.

### **Physics**

Motion, moments and pressure – Students learn how to interpret motion graphs. They consider applications and effects of pressure in different substances. They also investigate turning forces and their applications.

Particle models – Students study how atomic theory influences our understanding of physical processes and the nature of states of matter.

Energy Transfer and Electricity – Students study how energy can be transferred between stores of energy and the applications of this knowledge. Using a variety of electrical components they will learn their function, be able to do appropriate calculations and understand how these are used in a work based environment.

### **Grouping**

In Key Stage 3 Science students are taught in mixed ability groups.

### **Assessment**

Assessment in KS3 aims to:

- Inform teaching and/or learning directly,
- Assess agreed and shared objectives,
- Provide opportunities for peer- and self- assessment
- Provide opportunities for specific feedback to be given to and acted upon by individual students,
- Provide usable data or information that informs teachers of progress of classes and individuals.
- Each lesson includes informal checkpoints to track progress through a lesson. Checklist sheets are available which list all learning outcomes addressed in lessons. Students' progress can be assessed against broad band levels and rated as developing, secure or extending. At the end of each chapter, there is an automarked online assessment which is used to determine if students have a secure understanding of the chapter. This can be followed by a written progress test which generates a National Curriculum Level for each student.

- Opportunities for Assessing Pupil Progress (APP) assessment are included in each lesson and the teacher will use these to generate a further skills Level (3 – 8) for each student.

### **Literacy/Numeracy Skills**

Key literacy skills for Science include understanding meaning of scientific texts and identifying supporting ideas and evidence, adapting writing styles to suit audience and purpose, and the organisation of ideas and information.

The Activate scheme includes Literacy suggestions for most lessons. There are 'Big Writes' at the end of some chapters, focussing on extended writing skills. Quality of written communication questions are available for most lessons, and key words and a glossary help students learn scientific terms. By working through the resources provided, students will gain plenty of experience in a range of Literacy skills that have been identified as vital for success at Key Stage 4. This includes many opportunities for students to develop speaking and discussion skills both in small group and whole class situations.

### **Promoting Reading for Pleasure/Independent Reading**

All Science teachers recognise the link between reading for pleasure and attainment across all subjects. We are keen to promote this and seize all opportunities to link reading to the topics we deliver. Teachers are encouraged to talk about their own reading and prompt students to do the same, when appropriate.

### **Support, Strategies and Interventions for students (SEN, Most Able, Students not making Expected Progress)**

A variety of support is available through the Activate scheme, combining differentiation, levelled questions and tasks, and differentiation by tasks, as appropriate for each type of activity. Teachers use a variety of Assessment for Learning formative assessment techniques to plan and deliver lessons appropriately for the individuals in each class; including those identified as either SEN, more able, or not making expected progress. Teaching Assistants are assigned to individuals or groups within certain classes; they can be used to support individuals to complete tasks or may be used to guide the larger group whilst the Teachers' expertise is used to ensure progress for individuals.

### **Useful Resources for Home**

All students are given an individual 'log in' which allows access to the kerboodle site from home or homework club. <http://www.kerboodle.com/users/login>

### **How to help your child in KS3**

Please look at your child's book regularly and ensure that requests for corrections and follow-up questions from marking are addressed. Homework will be set regularly, and you should encourage your child to attempt all set tasks and to ask for further help of support if they are unsure about expectations. You could also work through some of the content on the website with them. You could also question them about their lessons in Science and ask them to explain ideas in as much detail as possible.

There will be assessments at the end of most topics. Reading through exercise books is a poor short term revision strategy and very ineffective in the longer term. If you see your child revising in this way, please encourage them to prepare materials that can be used for future assessments or exams.

If you have any concerns, please contact your child's Science teacher.

## **Glossary of terms**

Each strand of Science has an extensive range of subject specific terminology. Key words for each lesson and unit are available on the kerboodle website, located in the power point presentations for individual lessons studied. (<http://www.kerboodle.com/users/login>)