



# Science

## **Year 7**

Students follow the Key Stage 3 National Curriculum for England and Wales. Lessons involve a range of scientific theory, practical sessions, scientific research and assessment. At the end of each unit students are assessed, along with end of term assessments and practice SATs questions throughout the year. The Science units covered in Year 7 are related to scientific enquiry, life processes and living things, materials and their properties and physical processes. As part of the Science curriculum we aim to relate each topic to the student's surroundings and other subjects. As part of this aim this year students may visit different locations to take environmental readings, they may also participate in projects to support a more eco-friendly environment or study endangered species.

## **Year 8**

Students follow the Key Stage 3 English National Curriculum. Lessons involve a range of scientific theory, practical sessions, scientific research and assessment. At the end of each unit students are assessed, along with end of term assessments and practice SATs questions throughout the year. The Science units covered in Year 8 are related to scientific enquiry, life processes and living things, materials and their properties and physical processes. As part of the Science curriculum we seek to relate each topic to the student's surroundings and other subjects. As part of this aim, students may produce balanced diet plans, construct volcanoes, which can erupt and take part in environmental projects in relation to pollution.

## **Year 9**

Lessons involve a range of scientific theory, practical sessions, scientific research and assessment. At the end of each unit and term, students are assessed along with practice SATs questions throughout the year. The Science units covered in Year 9 are related to scientific enquiry, life processes and living things, materials and their properties and physical processes. As part of the Science curriculum we aim to relate each topic to the student's surroundings and other subjects. As part of this aim, students may produce fitness programmes and diet plans, car designs in order to increase performance and environmental projects in relation to pollution. Students will also have to demonstrate understanding of topics from previous years by participating in revision sessions.

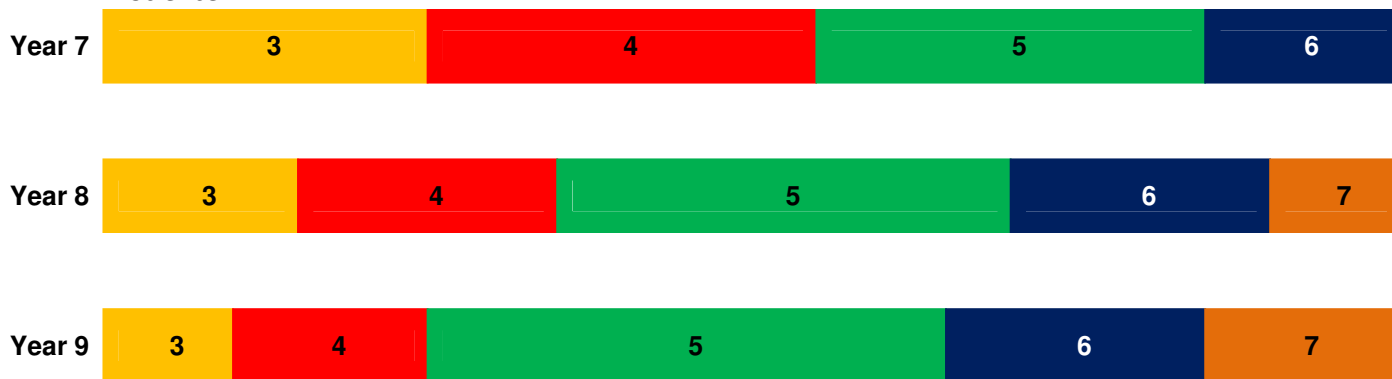
## **Marking and Assessment Process**

Students study 12 units in each year. They will receive a target sheet at the beginning of each module, explaining what level each learning objective in the topic is aimed at and a personal target level to work towards. Students then sit a SATs question based assessment at the end of each of these units which is levelled. Students will complete other pieces of assessed work across the year, including some level based 'Assessment for Learning' activities. These will be self, peer and teacher marked. There will be two formal assessment examinations over the year, one at the end of the first term and one at the end of the year.

### **KS3 Science homework**

All KS3 students are to complete both short term and long term homework tasks for each topic. They have a homework allocation of 1 hour per week. Each short term task will be allocated 30mins with long term tasks 1.5 - 2 hours per topic. Short term tasks may include spelling tests, worksheets, and research or SATs style questions. Long term homework tasks will be project based and may include investigation work, presentations or model making. As project work will have a longer time allocation students may be given up to 3 weeks to complete. Year 7 and 8 will complete a variety of short term and long term homework tasks throughout the year, with a minimum of one project per topic. Year 9 will also complete both short term and long term homework tasks until December. After that we aim to focus on revision tasks and SATs style questions in order to prepare the students for their SATs examinations. It will therefore be at the discretion of individual teachers to set appropriate homework for Year 9 starting January.

An approximate guide to the distribution of each level attained by students in the UK for Science



### Guidelines to the National Curriculum Levels in Science

These make up the four attainment targets in science:

- Sc1 Scientific enquiry
- Sc2 Life processes and living things
- Sc3 Materials and their properties
- Sc4 Physical processes.

#### Attainment target 1: Scientific enquiry

There are five aspects of attainment in this attainment target:

- Ideas and evidence
- Planning
- Carrying out
- Interpreting and evaluating
- Recording and presenting data

#### Attainment target 2: Life processes and living things

##### Level 4

Students demonstrate knowledge and understanding of life processes and living things drawn from the key stage 2 or key stage 3 programme of study. They use scientific names for some major organs of body systems *for example, the heart at key stage 2, the stomach at key stage 3* and identify the position of these organs in the human body. They identify organs *for example, stamen at key stage 2, stigma, root hairs at key stage 3* of different plants they observe. They use keys based on observable external features to help them to identify and group living things systematically. They recognise that feeding relationships exist between plants and animals in a habitat, and describe these relationships using food chains and terms *for example, predator and prey*.

##### Level 5

Students demonstrate an increasing knowledge and understanding of life processes and living things drawn from the key stage 2 or key stage 3 programme of study. They describe the main functions of organs of the human body *for example, the heart at key stage 2, stomach at key stage 3*, and of the plant *for example, the stamen at key stage 2, root hairs at key stage 3*. They explain how these functions are essential to the organism. They describe the main stages of the life cycles of humans and flowering plants and point out similarities. They recognise that there is a great variety of living things and understand the importance of classification. They explain that different organisms are found in different habitats because of differences in environmental factors *for example, the availability of light or water*.

##### Level 6

Students use knowledge and understanding drawn from the key stage 3 programme of study to describe and explain life processes and features of living things. They use appropriate scientific terminology when they describe life processes *for example, respiration, photosynthesis* in animals and plants. They distinguish between related processes *for example, pollination, and fertilisation*. They describe simple cell structure and identify differences between simple animal and plant cells. They describe some of the

causes of variation between living things. They explain that the distribution and abundance of organisms in habitats are affected by environmental factors *for example, the availability of light or water.*

#### Level 7

Students use knowledge and understanding of life processes and living things drawn from the key stage 3 programme of study to make links between life processes in animals and plants and the organ systems involved. They explain the processes of respiration and photosynthesis in terms of the main underlying chemical change. They use their knowledge of cell structure to explain how cells *for example, ovum, sperm, and root hair* are adapted to their functions. They identify common variations between individuals, including some features *for example, eye colour* that are inherited and others *for example, height* that can also be affected by environmental factors. They construct models *for example, food webs, and pyramids of numbers* to show feeding relationships, and explain how these relationships affect population size.

### Attainment target 3: Materials and their properties

#### Level 4

Students demonstrate knowledge and understanding of materials and their properties drawn from the key stage 2 or key stage 3 programme of study. They describe differences between the properties of different materials and explain how these differences are used to classify substances *for example, as solids, liquids, gases at key stage 2, as acids, alkalis at key stage 3.* They describe some methods *for example, filtration, distillation* that are used to separate simple mixtures. They use scientific terms *for example, evaporation, and condensation* to describe changes. They use knowledge about some reversible and irreversible changes to make simple predictions about whether other changes are reversible or not.

#### Level 5

Students demonstrate an increasing knowledge and understanding of materials and their properties drawn from the key stage 2 or key stage 3 programme of study. They describe some metallic properties *for example, good electrical conductivity* and use these properties to distinguish metals from other solids. They identify a range of contexts in which changes *for example, evaporation, and condensation* take place. They use knowledge about how a specific mixture *for example, salt and water; sand and water* can be separated to suggest ways in which other similar mixtures might be separated.

#### Level 6

Students use knowledge and understanding of the nature and behaviour of materials drawn from the key stage 3 programme of study to describe chemical and physical changes, and how new materials can be made. They recognise that matter is made up of particles, and describe differences between the arrangement and movement of particles in solids, liquids and gases. They identify and describe similarities between some chemical reactions *for example, the reactions of acids with metals, and the reactions of a variety of substances with oxygen.* They use word equations to summarise simple reactions. They relate changes of state to energy transfers in a range of contexts *for example, the formation of igneous rocks.*

#### Level 7

Students use knowledge and understanding drawn from the key stage 3 programme of study to make links between the nature and behaviour of materials and the particles of which they are composed. They use the particle model of matter in explanations of phenomena *for example, changes of state.* They explain differences between elements, compounds and mixtures in terms of their constituent particles. They recognise that elements and compounds can be represented by symbols and formulae. They apply their knowledge of physical and chemical processes to explain the behaviour of materials in a variety of contexts *for example, the way in which natural limestone is changed through the action of rainwater, ways in which rocks are weathered.* They use patterns of reactivity *for example; those associated with a reactivity series of metals* to make predictions about other chemical reactions.

### Attainment target 4: Physical processes

#### Level 4

Students demonstrate knowledge and understanding of physical processes drawn from the key stage 2 or key stage 3 programme of study. They describe and explain physical phenomena *for example, how a particular device may be connected to work in an electrical circuit, how the apparent position of the Sun changes over the course of a day.* They make generalisations about physical phenomena *for example; motion is affected by forces, including gravitational attraction, magnetic attraction and friction.* They use physical ideas to explain simple phenomena *for example, the formation of shadows, sounds being heard through a variety of materials.*

#### Level 5

Students demonstrate knowledge and understanding of physical processes drawn from the key stage 2 or key stage 3 programme of study. They use ideas to explain how to make a range of changes *for example, altering the current in a circuit, altering the pitch or loudness of a sound*. They use some abstract ideas in descriptions of familiar phenomena *for example, objects are seen when light from them enters the eye at key stage 2, and forces are balanced when an object is stationary at key stage 3*. They use simple models to explain effects that are caused by the movement of the Earth *for example, the length of a day or year*.

#### Level 6

Students use and apply knowledge and understanding of physical processes drawn from the key stage 3 programme of study. They use abstract ideas in some descriptions and explanations *for example, electric current as a way of transferring energy, the sum of several forces determining changes in the direction or the speed of movement of an object, wind and waves as energy resources available for use*. They recognise, and can give examples of, the wide application of many physical concepts *for example, the transfer of energy by light, sound or electricity, the refraction and dispersion of light*. They give explanations of phenomena in which a number of factors have to be considered *for example, the relative brightness of planets and stars*.

#### Level 7

Students use knowledge and understanding of physical processes drawn from the key stage 3 programme of study to make links between different phenomena. They make connections between electricity and magnetism when explaining phenomena *for example, the strength of electromagnets*. They use some quantitative definitions *for example, speed, and pressure* and perform calculations, using the correct units. They apply abstract ideas in explanations of a range of physical phenomena *for example, the appearance of objects in different colours of light, the relationship between the frequency of vibration and the pitch of a sound, the role of gravitational attraction in determining the motion of bodies in the solar system, the dissipation of energy during energy transfers*.