

**Curriculum Area: Science**

**Year Group: 6**

## **An Introduction to Year 6**

During year 6 pupils consolidate their scientific knowledge and understanding and make connections between different areas of science. They use scientific ideas and models to explain phenomena and events, and to understand a range of familiar applications of science. They think about the positive and negative effects of scientific and technological developments on the environment and in other contexts.

They take account of others' views and understand why opinions may differ within the classroom and in a broader sense, in the scientific field. They do more quantitative work, carrying out and designing investigations on their own and with others. They evaluate their work and the work of their peers, in particular the strength of the evidence they and others have collected.

They select and use a wide range of reference sources with confidence and create biographies when conducting research. They communicate clearly what they have hypothesized, designed, investigated and discovered as well as its significance. They learn how scientists work together on present day scientific developments and are up to date with current news and headlines in the scientific field. They consider the importance of experimental evidence in supporting scientific ideas.

***Key Stage: 3***

***Expected Level of Attainment: 5c***

### Sc1 Scientific enquiry

Students should be taught (to):

- About the interplay between empirical questions, evidence and scientific explanations using historical and contemporary examples
- About the ways in which scientists work today and how they worked in the past and that it is important to test explanations by using them to make predictions and by seeing if evidence matches the predictions
- Use scientific knowledge and understanding to turn ideas into a form that can be investigated, and to decide on an appropriate approach and decide whether to use evidence from first-hand experience or secondary sources
- Consider key factors to be taken into account when collecting evidence, how evidence may be collected in different contexts, decide the extent and range of data to be collected and the techniques, equipment and materials to use

- Use a range of equipment and materials appropriately, make observations and measurements, including the use of ICT, make sufficient relevant observations and measurements to reduce error and obtain reliable evidence and use a wide range of methods to represent and communicate qualitative and quantitative data
- Use diagrams, tables, charts and graphs to identify and describe patterns in data, use data to draw conclusions, decide to what extent these conclusions support a prediction, use their scientific knowledge and understanding to explain and interpret observations, measurements and conclusions
- Consider anomalies in observations or measurements and suggest improvements to the methods used, where appropriate

## Sc2 Life processes and living things

Students should be taught (to):

- How organs are formed, the functions of different kinds of cells in both plant and animal cells, ways in which some cells are adapted to their functions, that fertilisation is the fusion of a male and a female cell and to relate cells and cell functions to life processes
- About the need for a balanced diet, the principles of digestion, including the role of enzymes and that food is used as a fuel to maintain the body's activity and for growth and repair
- The role of the skeleton and joints and the principle of antagonistic muscle pairs in movement, the role of lung structure in gas exchange, including the effect of smoking, processes involved in aerobic respiration and the affects of drugs on health.
- About the physical and emotional changes that take place during adolescence, about the human reproductive system
- The process of photosynthesis, the role of root hairs in absorbing water and minerals from the soil and that plants carry out aerobic respiration.
- About environmental and inherited causes of variation within a species, to classify living things into the major taxonomic groups and that selective breeding can lead to new varieties.
- About ways in which living things and the environment can be protected, that habitats support a diversity of plants and animals, how some organisms are adapted to survive daily and seasonal changes
- In their habitats and how predation and competition for resources affect the size of populations

- About food webs composed of several food chains, and how food chains can be quantified

## Sc3 Materials and their properties

Students should be taught (to):

- How to design and construct series and parallel circuits, how to measure current and voltage, things that affect the current of a circuit and how energy is transferred within electrical circuits
- About magnetic fields, that a current in a coil produces a magnetic field pattern similar to that of a bar magnet and how electromagnets are constructed and used
- How to use determine the speed of an object, that the weight of an object on Earth is the result of gravity, that unbalanced forces change the speed or direction of movement of objects and ways in which frictional forces affect motion
- That forces can cause objects to turn about a pivot, the quantitative relationship between force, area and pressure and its application
- That light travels in a straight line at a finite speed in a uniform medium, that non-luminous objects are seen because light scattered from them enters the eye, how light can be reflected, refracted and dispersed and the effect of colour filters
- That sound causes the eardrum to vibrate and that different people have different audible ranges and some effects of loud sounds on the ear
- Compare the forces of light and sound That light can travel through a vacuum but sound cannot, and that light travels much faster than sound, the relationship between the loudness and pitch and amplitude and frequency of vibrations
- The relative positions of the Earth, Sun and planets in the solar system, how the orbits of the earth and moon cause day and night, seasons and tides and gravity
- That the Sun and other stars are light sources and that the planets and other bodies are seen by reflected light and about the use of artificial satellites and probes to observe the Earth and to explore the solar system
- About the variety of energy resources and the distinction between renewable and non-renewable resources, about the Sun as the ultimate source of most of the Earth's energy resources and that electricity is generated by means of a variety of energy resources
- The distinction between temperature and heat, and their relationship to energy, ways in which energy can be usefully transferred and stored

- About conduction, convection and evaporation, and that energy is transferred directly by radiation and that although energy is always conserved, it may be dissipated, reducing its availability as a resource

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## **Autumn Term**

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-Interdependence and adaptation; Extend knowledge of the way in which plants and animals in different habitats depend upon each other and are suited to their environment.

-Micro-organisms; Learn that there are many very small organisms called micro-organisms which feed, grow and reproduce and which may be harmful or beneficial.

## **Science Investigation & Experiments**

### **Spring Term**

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*Creative Curriculum Topic; 'Famous vs. Infamous'*

-More about dissolving; Consolidates and extend children's understanding of what happens when a variety of solids dissolve.

- Reversible and irreversible changes; Bring together and consolidate work that children have done before on reversible changes.

-Forces in Action; Apply their knowledge of a variety of forces, including magnetic attraction, gravitational attraction and friction.

## **Science Investigation & Experiments**

### **Summer Term**

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*Creative Curriculum Topic; 'Food, Glorious Food'*

-How We See Things; Learn that mirrors and shiny surfaces alter the direction in which light travels and that when they see objects, light enters the eye.

-Changing Circuits; Consolidate children's knowledge of materials which are electrical conductors.

## **Science Investigation & Experiments**

### **Excursions & Further Experiences**

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Excursions out of school to places around London such as the Science Museum, Natural History Museum, Chelsea Physics Garden and Kew Gardens are arranged when appropriate. In school visits from the Science Museum are arranged as a way of rekindling children's natural curiosity and interest in Science and as a means of inspiring them

### **Assessment**

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Ongoing informal assessment plays an important part of Science in the classroom. This is carried out throughout each topic through debates, in class discussion, and questioning. On top of this, each topic is ended with a formal assessment to gauge each child's level based on the National guidelines. These are

created by the teacher using a range of resources (such as *Rising Stars*) and tailored around what each class has been taught and relate to the creative curriculum topic when appropriate.

## **Reporting to Parents**

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In Year Six parents are informed of their child's progress at the end of the Autumn, Spring and Summer term by both a written report as well as through a discussion during parent's evenings.

## **Schemes of Work, Texts and Equipment**

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Study Guides Science; Rising Stars

Rising Stars Schemes of Work

National Curriculum; [www.curriculum.qcda.gov.uk](http://www.curriculum.qcda.gov.uk)

'The Grid' (resources for QCA); [www.thegrid.org.uk](http://www.thegrid.org.uk)

The Standards Site; [www.webarchive.nationalarchives.gov.uk](http://www.webarchive.nationalarchives.gov.uk)