

### SCIENCE: CORE LEARNING OUTCOMES for Years 1 to 10

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| **Strand** | **Key Concept** | **Level 1** | **Level 2** | **Level 3** | **Level 4** | **Level 5** | **Level 6** |
| Science and Society | Historical and cultural factors influence the nature and direction of science which, in turn, affects the development of society. | 1.1 Students discuss their own thinking about natural phenomena. | 2.1 Students discuss their own ideas about the ways in which science can be described and compare their ideas with those of others. | 3.1 Students relate some of the ways that people of various historical and cultural backgrounds construct and communicate their understandings of the same natural phenomena. | 4.1 Students outline some contributions to the development of scientific ideas made by people from different cultural and historical backgrounds. | 5.1 Students consider how and why scientific ideas have changed over time. | 6.1 Students evaluate contributions to the development of scientific ideas made by individuals and groups in the past and present, and consider factors which have assisted or hindered them. |
| Science as a ‘way of knowing’ is shaped by the ways that humans construct their understandings | 1.2 Students collect information about natural phenomena and recognise that some ways of collecting information are more appropriate than others in different situations. | 2.2 Students identify some ways scientists think and work. | 3.2 Students recognise the need for quantitative data when describing natural phenomena. | 4.2 Students use the elements of a fair test when considering the design of their investigations. | 5.2 Students refine investigations after evaluating variations and inconsistencies in experimental findings. | 6.2 Students design and perform controlled investigations to produce believable evidence. |
| Decisions about the ways that science is applied have short- and long-term implications for the environment, communities and individuals. | 1.3 Students illustrate different ways that applications of science affect their daily lives. | 2.3 Students explain some of the ways that applications of science affect their community. | 3.3 Students make predictions about the immediate impact of some applications of science on their community and environment, and consider possible pollution and public health effects. | 4.3 Students present analyses of the short- and long-term effects of some of the ways in which science is used. | 5.3 Students analyse the relationship between social attitudes and decisions about the applications of science. | 6.3 Students use scientific concepts to evaluate the costs and benefits of applications of science (including agricultural and industrial practices). |
| Earth and Beyond | The Earth, solar system and universe are dynamic systems. | 1.1 Students identify and describe obvious features of the Earth and sky (including landforms and clouds).  | 2.1 Students identify and describe changes in the obvious features of the Earth and sky (including changes in the appearance of the moon.) | 3.1 Students identify and describe some interactions (including weathering and erosion) that occur within systems on Earth and beyond. | 4.1 Students recognise and analyse some interactions (including the weather) between systems of Earth and beyond. | 5.1 Students explain how present-day features and events can be used to make inferences about past events and changes in Earth and beyond. | 6.1 Students use scientific ideas and theories about interactions within and between systems of the Earth and beyond to explain past and present features and events. |
| Events on Earth, in the solar system and in the universe occur on different scales of time and space. | 1.2 Students describe obvious events (including day and night) that occur on the Earth and in the sky. | 2.2 Students identify and describe short- and long-term patterns of events (including weather and seasons) that occur on the Earth and in the sky. | 3.2 Students discuss regular and irregular events in time and space that occur on the Earth and in the sky. | 4.2 Students collect information which illustrates that changes on Earth and in the solar system occur on different scales of time and space. | 5.2 Students infer from data that the events that occur on Earth and in the solar system can have effects at other times and in other places. | 6.2 Students use scientific ideas about the Earth and components of the universe to explain how events over time and in space can lead to catastrophic changes. |
| Living things use the resources of the Earth, solar system and universe to meet their needs. | 1.3 Students discuss the uses they make and the care they take of the Earth. | 2.3 Students discuss how their community uses resources and features of the Earth and sky. | 3.3 Students collect information which describes ways in which living things use the Earth and the sun as resources. | 4.3 Students summarise information to compare ways in which different communities use resources from the Earth and beyond. | 5.3 Students prepare scenarios about the use of renewable and non-renewable resources of the Earth and beyond. | 6.3 Students argue a position regarding stewardship of the Earth and beyond, and consider the implications of using renewable and non-renewable resources. |
| Energy and Change | The forces acting on objects influence their motion, shape, behaviour and energy. | 1.1 Students collect information about the ways that objects of different shapes and sizes move. | 2.1 Students demonstrate different ways that forces (including push and pull) change the shape and motion of objects. | 3.1 Students collect data and make and test inferences to describe the effects of forces (including magnetic and electrostatic forces) on the motion and shape of objects. | 4.1 Students design and perform investigations into relationships between forces, motion and energy. | 5.1 Students analyse situations where various forces (including balanced and unbalanced forces) act on objects. | 6.1 Students use scientific ideas of motion (including action and reaction) to explain everyday experiences. |
| In interactions and changes, energy is transferred and transformed but is not created or destroyed. | 1.2 Students identify the effects of energy in their daily lives. | 2.2 Students identify and describe forms of energy in their community (including heat and energy of movement). | 3.2 Students identify forms of energy (including electrical and sound energy) and describe the effects and characteristics of those different forms. | 4.2 Students collect and present information about the transfer and transformation of energy (including potential and kinetic energy). | 5.2 Students explain how energy is transferred and transformed (including energy transfer by convection and conduction). | 6.2 Students model and analyse applications of energy transfer and transformation. |
| There are different ways of obtaining and utilising energy and these have different consequences. | 1.3 Students make links between the way they use energy and the immediate source of that energy. | 2.3 Students illustrate the ways that energy is used in their community. | 3.3 Students identify different ways of obtaining energy. | 4.3 Students present alternative ways of obtaining and using energy (including energy from the sun and from fossil fuels) for particular purposes. | 5.3 Students discuss the consequences of different ways of obtaining and using energy (including nuclear energy). | 6.3 Students evaluate the immediate and long-term consequences of different ways of obtaining and using energy. |
| Life and Living | The characteristics of an organism and its functioning are interrelated. | 1.1 Students discuss their thinking about needs of living things. | 2.1 Students look for patterns and relationships between the features of different living things and how those living things meet their needs. | 3.1 Students draw conclusions about the relationship between features of living things and the environments in which they live. | 4.1 Students examine the internal and external structure of living things (including animal respiratory systems and plant systems) and account for observed similarities and differences in terms of adaptation. | 5.1 Students collect information about the structure (including cell structure) and function of living things and relate structure and function to survival. | 6.1 Students seek reasons for and can explain why functioning and behaviour change in response to variations in internal and external conditions (including disease, temperature, water and light). |
| Evolutionary processes have given rise to a diversity of living things which can be grouped according to their characteristics. | 1.2 Students group living things in different ways based on observable features. | 2.2 Students illustrate changes which take place in the course of the life span of living things (including the growth of a plant and an animal). | 3.2 Students present information which illustrates stages in different types of life cycles (including metamorphosis) of familiar living things. | 4.2 Students identify and analyse similarities and differences in the ways that different living things reproduce. | 5.2 Students evaluate different processes and strategies of reproduction (including asexual reproduction and care of young) in terms of their relative efficiency in ensuring survival of offspring. | 6.2 Students use scientific ideas (including concepts of genetics and natural selection) to explain how variation in living things leads to change in species over time. |
| Environments are dynamic and have living and non-living components which interact. | 1.3 Students observe and describe components of familiar environments. | 2.3 Students make links between different features of the environment and the specific needs of living things. | 3.3 Students describe some interactions (including feeding relationships ) between living things and between living and non-living parts of the environment. | 4.3 Students make generalisations about the types of interaction which take place between the living and non-living parts of the environment. | 5.3 Students evaluate the consequences of interactions between the living and non-living parts of environments. | 6.3 Students prepare scenarios to describe the potential long-term effects of changes in biodiversity caused by human action on ecosystems. |
| **Natural and Processed** **Materials** | The properties and structure of materials are interrelated. | 1.1 Students describe observable properties of familiar materials (including solids and liquids). | 2.1 Students group materials on the basis of properties (including solubility, texture and hardness). | 3.1 Students examine and describe the smaller visible parts of common materials and relate these to the properties of the materials. | 4.1 Students collect information and propose ideas to explain the properties of materials in terms of each material’s underlying structure. | 5.1 Students present information in a variety of ways to explain the structure and behaviour of matter in terms of particles of which it is made. | 6.1 Students explain the structure and properties of matter using models of atoms and molecules. |
| Patterns of interactions between materials can be identified and used to predict and control further interactions. | 1.2 Students describe observable changes (including change of state) that occur in materials. | 2.2 Students recognise ways in which changes in properties of familiar materials occur (including temperature change and magnetism). | 3.2 Students compare properties of materials before and after physical and chemical changes. | 4.2 Students identify patterns in the types of change that take place in materials. | 5.2 Students make inferences about the effect of various factors (including temperature of the reaction and surface area of the reactants) on the nature and rate of reactions. | 6.2 Students use identified patterns of change to predict interactions between materials. |
| The uses of materials are determined by their properties, some of which can be changed. | 1.3 Students look for alternative ways that familiar materials can be used. | 2.3 Students explain why common materials are used in particular situations. | 3.3 Students collect information to illustrate how combining different materials influences their usefulness. | 4.3 Students examine and assess ways that materials can be changed to make them more useful. | 5.3 Students devise tests and interpret data to show that the properties and interactions of materials influence their use. | 6.3 Students collect and present information about the relationship between the commercial production of industrial, agricultural and fuel products and their properties. |