Australian Curriculum - Science

Foundation Year

Key Ideas

In Foundation, students observe and describe the behaviours and properties of everyday objects, materials and living things. They explore change in the world around them, including changes that impact on them, such as the weather, and changes they can effect, such as making things move or change shape. They learn that seeking answers to questions they pose and making observations is a core part of science and use their senses to gather different types of information.

Content Descriptors

Objects are made of materials that have observable properties (ACSSU003)

The way objects move depends on a variety of factors, including their size and shape (ACSSU005

Science involves observing, asking questions about, and describing changes in, objects and events (ACSHE013

Year 1

Key Ideas

In Year 1, students infer simple cause-and-effect relationships from their observations and experiences, and begin to link events and phenomena with observable effects and to ask questions. They observe changes that can be large or small and happen quickly or slowly. They explore the properties of familiar objects and phenomena, identifying similarities and differences. Students begin to value counting as a means of comparing observations, and are introduced to ways of organising their observations.

Content Descriptors

Everyday materials can be physically changed in a variety of ways (ACSSU018

Light and sound are produced by a range of sources and can be sensed (ACSSU020

Science involves observing, asking questions about, and describing changes in, objects and events (ACSHE021

Year 2

Key Ideas

In Year 2, students describe the components of simple systems, such as stationary objects subjected to pushes or pulls, or combinations of materials, and show how objects and materials interact through direct manipulation. They observe patterns of growth and change in living things, and describe patterns and make predictions. They explore the use of resources from Earth and are introduced to the idea of the flow of matter when considering how water is used. They use counting and informal measurements to make and compare observations and begin to recognise that organising these observations in tables makes it easier to show patterns.

Content Descriptors

Different materials can be combined for a particular purpose (ACSSU031

Earth's resources are used in a variety of ways (ACSSU032

A push or a pull affects how an object moves or changes shape (ACSSU033

Pose and respond to questions, and make predictions about familiar objects and events (ACSIS037

Year 3

Key Ideas

n Year 3, students observe heat and its effects on solids and liquids and begin to develop an understanding of energy flows through simple systems. In observing day and night, they develop an appreciation of regular and predictable cycles. Students order their observations by grouping and classifying; in classifying things as living or non-living they begin to recognise that classifications are not always easy to define or apply. They begin to quantify their observations to enable comparison, and learn more sophisticated ways of identifying and representing relationships, including the use of tables and graphs to identify trends. They use their understanding of relationships between components of simple systems to make predictions.

Content Descriptors

A change of state between solid and liquid can be caused by adding or removing heat (ACSSU046

Heat can be produced in many ways and can move from one object to another (ACSSU049

Year 4

Key Ideas

In Year 4, students broaden their understanding of classification and form and function through an exploration of the properties of natural and processed materials. They learn that forces include non-contact forces and begin to appreciate that some interactions result from phenomena that can't be seen with the naked eye. They begin to appreciate that current systems, such as Earth's surface, have characteristics that have resulted from past changes and that living things form part of systems. They understand that some systems change in predictable ways, such as through cycles. They apply their knowledge to make predictions based on interactions within systems, including those involving the actions of humans.

Content Descriptors

Natural and processed materials have a range of physical properties that can influence their use (ACSSU074

Forces can be exerted by one object on another through direct contact or from a distance (ACSSU076

Year 5

Key Ideas

In Year 5, students are introduced to cause and effect relationships through an exploration of adaptations of living things and how this links to form and function. They explore observable phenomena associated with light and begin to appreciate that phenomena have sets of characteristic behaviours. They broaden their classification of matter to include gases and begin to see how matter structures the world around them. Students consider Earth as a component within a solar system and use models for investigating systems at astronomical scales. Students begin to identify stable and dynamic aspects of systems, and learn how to look for patterns and relationships between components of systems. They develop explanations for the patterns they observe.

Content Descriptors

Solids, liquids and gases have different observable properties and behave in different ways (ACSSU077

Light from a source forms shadows and can be absorbed, reflected and refracted (ACSSU080

Year 6

Key Ideas

In Year 6, students explore how changes can be classified in different ways. They learn about transfer and transformations of electricity, and continue to develop an understanding of energy flows through systems. They link their experiences of electric circuits as a system at one scale to generation of electricity from a variety of sources at another scale and begin to see links between these systems. They develop a view of Earth as a dynamic system, in which changes in one aspect of the system impact on other aspects; similarly, they see that the growth and survival of living things are dependent on matter and energy flows within a larger system. Students begin to see the role of variables in measuring changes and the value of accuracy in these measurements. They learn how to look for patterns and to use these to identify and explain relationships by drawing on evidence.

Content Descriptors

Changes to materials can be reversible or irreversible (ACSSU095

Electrical energy can be transferred and transformed in electrical circuits and can be generated from a range of sources (ACSSU097

Year 7

Key Ideas

In Year 7, students explore the diversity of life on Earth and continue to develop their understanding of the role of classification in ordering and organising information. They use and develop models such as food chains, food webs and the water cycle to represent and analyse the flow of energy and matter through ecosystems and explore the impact of changing components within these systems. They consider the interaction between multiple forces when explaining changes in an object's motion. They explore the notion of renewable and non-renewable resources and consider how this classification depends on the timescale considered. They investigate relationships in the Earth-sun-moon system and use models to predict and explain events. Students make accurate measurements and control variables to analyse relationships between system components. They explore and explain these relationships through appropriate representations and consider the role of science in decision making processes.

Content Descriptors

Mixtures, including solutions, contain a combination of pure substances that can be separated using a range of techniques (ACSSU113

Some of Earth's resources are renewable, including water that cycles through the environment, but others are non-renewable (ACSSU116

Change to an object's motion is caused by unbalanced forces, including Earth's gravitational attraction, acting on the object (ACSSU117

Year 8

Key Ideas

In Year 8, students are introduced to cells as microscopic structures that explain macroscopic properties of living systems. They link form and function at a cellular level and explore the organisation of body systems in terms of flows of matter between interdependent organs. Similarly, they explore changes in matter at a particle level, and distinguish between chemical and physical change. They begin to classify different forms of energy, and describe the role of energy in causing change in systems, including the role of heat and kinetic energy in the rock cycle. Students use experimentation to isolate relationships between components in systems and explain these relationships through increasingly complex representations. They make predictions and propose explanations, drawing on evidence to support their views while considering other points of view.

Content Descriptors

Properties of the different states of matter can be explained in terms of the motion and arrangement of particles (ACSSU151

Differences between elements, compounds and mixtures can be described at a particle level (ACSSU152

Chemical change involves substances reacting to form new substances (ACSSU225

Energy appears in different forms, including movement (kinetic energy), heat and potential energy, and energy transformations and transfers cause change within systems (ACSSU155

Year 9

Key Ideas

In Year 9, students consider the operation of systems at a range of scales. They explore ways in which the human body as a system responds to its external environment and the interdependencies between biotic and abiotic components of ecosystems. They are introduced to the notion of the atom as a system of protons, electrons and neutrons, and how this system can change through nuclear decay. They learn that matter can be rearranged through chemical change and that these changes play an important role in many systems. They are introduced to the concept of the conservation of matter and begin to develop a more sophisticated view of energy transfer. They begin to apply their understanding of energy and forces to global systems such as continental movement.

Content Descriptors

All matter is made of atoms that are composed of protons, neutrons and electrons; natural radioactivity arises from the decay of nuclei in atoms (ACSSU177

Chemical reactions involve rearranging atoms to form new substances; during a chemical reaction mass is not created or destroyed (ACSSU178

Chemical reactions, including combustion and the reactions of acids, are important in both non-living and living systems and involve energy transfer (ACSSU179

Energy transfer through different mediums can be explained using wave and particle models (ACSSU182

Year 10

Key Ideas

In the Year 10 curriculum students explore systems at different scales and connect microscopic and macroscopic properties to explain phenomena. Students explore the biological, chemical, geological and physical evidence for different theories, such as the theories of natural selection and the Big Bang.

Students develop their understanding of atomic theory to understand relationships within the periodic table. They understand that motion and forces are related by applying physical laws. They learn about the relationships between aspects of the living, physical and chemical world that are applied to systems on a local and global scale and this enables them to predict how changes will affect equilibrium within these systems.

Content Descriptors

The atomic structure and properties of elements are used to organise them in the Periodic Table (ACSSU186

Different types of chemical reactions are used to produce a range of products and can occur at different rates (ACSSU187

Global systems, including the carbon cycle, rely on interactions involving the biosphere, lithosphere, hydrosphere and atmosphere (ACSSU189

Energy conservation in a system can be explained by describing energy transfers and transformations (ACSSU190

The motion of objects can be described and predicted using the laws of physics (ACSSU229