Queensland Curriculum, Assessment and Reporting Framework

Science

Essential Learnings by the end of Year 7

Learning and assessment focus

Students use their scientific knowledge, curiosity, senses and intuition as a basis for investigating and testing their scientific thinking about the world. They understand that science is a body of knowledge developed over a long period of time through observations of, and inferences from, the natural world. They understand that science is a way of thinking and working, and they consider and respond to decisions about science and its impact on people, their environment and their communities. They recognise the many different fields of science, and the people who work as scientists and in other occupations that use scientific knowledge.

Students use the essential processes of **Ways of working** to develop and demonstrate their **Knowledge and understanding**. They develop their ability to work scientifically by formulating scientific questions, and by individually and collaboratively designing and conducting scientific investigations. They reflect on their learning and investigations to clarify values and the impacts of science.

Students select and use tools and technologies, including information and communication technologies (ICTs), in purposeful ways. They make use of the potential that ICTs provide to inquire, create and communicate within scientific contexts.

Students demonstrate evidence of their learning over time in relation to the following assessable elements:

- knowledge and understanding
- investigating
- communicating
- reflecting.

Queensland Government
Department of Education, Training and the Arts

Queensland Studies Authority
Partnership and innovation

Ways of working

Students are able to:

- identify problems and issues, and formulate testable scientific questions
- plan investigations, including identifying conditions for a fair comparison, variables to be changed and variables to be measured
- collect and analyse first- and second-hand data, information and evidence
- evaluate information and evidence and identify and analyse errors in data
- select and use scientific tools and technologies suited to the investigation
- draw conclusions that summarise and explain patterns in data and are supported by experimental evidence and scientific concepts
- communicate scientific ideas, data and evidence, using scientific terminology suited to the context and purpose
- identify, apply and justify safe practices
- reflect on different points of view and recognise and clarify people's values relating to the applications and impacts of science
- reflect on learning, apply new understandings and identify future applications.

Knowledge and understanding

Science as a human endeavour

Science impacts on people, their environment and their communities.

- Scientific knowledge has been accumulated and refined over time, and can be used to change the way people live
  e.g. use of and changes to technology, including mobile phones and computers; improved medical procedures.
- Ethical considerations are involved in decisions made about applications of science
  e.g. preservation of wilderness environments to help protect endangered species.
- Scientific knowledge can help to make natural, social and built environments sustainable, at a scale ranging from local to global
  e.g. recycling to reduce resource use.
- Different cultures, including those of Aboriginal people and Torres Strait Islander people, have contributed to science and scientific practice
  e.g. Indigenous knowledge of flora and fauna makes contributions to scientific knowledge and the development of pharmaceutical products; traditional Chinese medicine recognises relationships between the human body and the environment; English scientist, Sir Isaac Newton, described gravity.

Earth and beyond

Interactions and changes in physical systems and environments can be explained and predicted.

- Gravitational attraction between objects in the solar system holds them in fixed orbits, and has predictable effects on the earth
  e.g. changing tides are a result of gravitational attraction between the earth, the moon and the sun.
- Changes to the earth occur over varying time periods and can be interpreted using geological evidence
  e.g. changes that are part of the water cycle occur over a shorter time scale than does rock formation; change over time can be identified through fossils and rock layers.

Energy and change

Forces and energy can be identified and analysed to provide explanations that benefit community lifestyles and decision making.

- The motion of an object changes as a result of the application of opposing or supporting forces
  e.g. a surfer makes use of a number of forces, including gravity, buoyancy and the motion of the water, to ride a wave.
- Renewable and non-renewable energy sources can be identified and used for different purposes
  e.g. wind or coal is used to generate electricity; wind can also be used to pump water.
- Energy can be transferred and transformed
  e.g. recharging a car battery transforms electrical energy into chemical energy that is stored in the battery; plants transform light energy from the sun into chemical energy that is stored.

Life and living

Living things have structures that enable them to survive and reproduce.

- Cells are the basic unit of all living things and perform functions that are needed to sustain and reproduce life
  e.g. some organisms are single-celled; complex organisms such as humans are collections of specialised cells.
- Systems of scientific classification can be applied to living things
  e.g. dichotomous keys can be designed for groups of organisms.
- Survival of organisms is dependent on their adaptation to their environment
  e.g. animals use camouflage to protect themselves; plants in very dry areas may store water in modified structures.
- Different feeding relationships exist within an ecosystem
  e.g. producer, consumer, herbivore, carnivore relationships form a food web.

Natural and processed materials

Properties, changes and uses of substances and mixtures are related to their particular composition.

- Properties of a material will vary according to the type and quantity of components that make up its structure
  e.g. the colour of a paint depends on the proportion of different colours in the mixture; durability of Aboriginal arts works is dependent on paint ingredients; different alloys of iron produce different amounts of rust.
- Chemical change produces new substances that have properties different from those of the original substances
  e.g. burning paper produces ash.
- Physical change produces no new substances
  e.g. changing a solid to a liquid and back to a solid.

