



Science

Essential Learnings by the end of **Year 5**

Learning and assessment focus

Students use their curiosity, senses and intuition as a basis for exploring, investigating and testing their scientific thinking about the world. They understand that science is a way of constructing new knowledge and that it is based on observations of, and inferences from, the natural world. They understand that science can contribute to the understanding of many different kinds of activities, including work and leisure. They are aware that people of all ages and backgrounds choose to work in science or science-related careers.

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, by conducting scientific activities, and by individually and collaboratively planning and conducting investigations. They reflect on their learning and their own and others' points of view and values relating to science.

Students select and use tools and technologies, including information and communication technologies (ICTs), in purposeful ways. They use ICTs as an integral component of their learning, 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.

Ways of working

Students are able to:

- pose and refine simple questions, and make predictions to be tested
- plan activities and investigations, identifying and using elements of a fair test
- collect and organise data, information and evidence
- evaluate information and evidence to support data gathered from activities and investigations
- select and use tools, technologies and materials suited to the activities and investigations
- draw conclusions that are supported by evidence, reproducible data and established scientific concepts
- communicate scientific ideas, data and findings, using scientific terminology and formats appropriate to context and purpose
- identify and apply safe practices
- reflect on and identify different points of view and consider other people's values relating to science
- reflect on learning to identify new understandings and future applications.

Knowledge and understanding

Science as a human endeavour

Science relates to students' own experiences and activities in the community.

- Scientific ideas can be used to explain the development and workings of everyday items
e.g. scientific notions of energy can help explain how a bicycle moves.
- Ethics is a significant part of scientific endeavour
e.g. an ethical consideration is whether or not it is appropriate to test products on animals.
- Science can help to make natural, social and built environments sustainable and may influence personal human activities
e.g. implementing "green" strategies may help to minimise a person's "ecological footprint".
- Science can contribute to people's work and leisure
e.g. the development of new technologies has contributed to increased efficiency in the workplace; people can have a healthier lifestyle if they understand how their physical development benefits from physical activity and healthy food choices.
- Cultures from around the world, including those of Aboriginal people and Torres Strait Islander people, have contributed to scientific understanding
e.g. Aboriginal people extract dyes from natural materials; Galileo, an Italian scientist, described motion of objects in the solar system.

Earth and beyond

Changes and patterns in different environments and space have scientific explanations.

- The earth, solar system and universe are dynamic systems
e.g. the idea that planets orbit the sun and moons orbit planets can be used to explain day and night and the phases of the moon.
- Changes to the surface of the earth or the atmosphere have identifiable causes, including human and natural activity
e.g. weathering and erosion; air pollution.

Energy and change

Actions of forces, and forms and uses of energy, are evident in the everyday world.

- The greater the force on an object, the greater the change in shape or motion
e.g. pressing harder on a plasticine ball makes it flatter; the harder a ball is thrown the further it travels.
- Forces may act at a distance or may need to be in contact with an object to affect it
e.g. magnetic and gravitational forces attract objects from a distance; hitting a ball requires contact with a bat.
- Energy can be transferred from one object to another
e.g. a heater transfers warmth to a nearby human body.
- Different forms of energy used within a community have different sources
e.g. electricity can be generated from a range of sources, including coal and solar energy.

Life and living

Living things have features that determine their interactions with the environment.

- Living things can be grouped according to their observable characteristics
e.g. insects have six legs; marsupials have pouches; fish have gills and fins.
- Structures of living things have particular functions
e.g. roots bring water and minerals to plants; skeletons give bodies shape and protect vital organs.
- Reproductive processes and life cycles vary in different types of living things
e.g. plants reproduce by seeds, bulbs and cuttings; animals may lay eggs or produce live young.
- Living things have relationships with other living things and their environment
e.g. the relationship between clown fish and an anemone on a coral reef is mutually beneficial.

Natural and processed materials

Properties, changes and uses of materials are related.

- Materials are composed of smaller parts, some of which may be visible to the naked eye, while others are too small to be seen
e.g. cloth can be made up of interwoven fibres; rocks may be composed of visible crystals.
- Materials are used for a particular purpose because of their specific properties
e.g. lunch boxes and water bottles are made of plastic, because plastic is durable and water resistant.
- The properties of an object can differ from the properties of its component parts
e.g. concrete differs from the cement, water and sand from which it is made.
- Properties of materials are affected by processes of change
e.g. sugar dissolves in water; ingredients interact when a cake is baked.