Western Australian Curriculum

Science

Scope and sequence of the mandated curriculum content

Pre-primary–Year 10 | Revised curriculum

For familiarisation in 2025

**Acknowledgement of Country**

Kaya. The School Curriculum and Standards Authority (the Authority) acknowledges that our offices are on Whadjuk Noongar boodjar and that we deliver our services on the country of many traditional custodians and language groups throughout Western Australia. The Authority acknowledges the traditional custodians throughout Western Australia and their continuing connection to land, waters and community. We offer our respect to Elders past and present.

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Overview

The current Western Australian Curriculum: Science was adopted from the Australian Curriculum version 8.1.

The revised Western Australian Curriculum: Science is adopted and adapted from the Australian Curriculum version 9.

Guide to reading this document

The Scope and sequence shows the **mandated** curriculum for teaching, written as **content descriptions** across year levels so that a sequence of content can be viewed across the years of schooling from Pre‑primary to Year 10.

The document is organised by two Science strands: Science understanding and Science inquiry.

The Science understanding strand includes: Biological sciences; Chemical sciences; Earth and space sciences; and Physical sciences.

The Science inquiry strand includes: Questioning and predicting; Planning and conducting; Processing, modelling and analysing; Evaluating; Communicating; and Collaborating and applying.

The table below outlines the learning area organisation for the Pre-primary to Year 10 Science curriculum.

|  |  |  |  |
| --- | --- | --- | --- |
| **Science understanding** | | | |
| Biological sciences | Chemical sciences | Earth and space sciences | Physical sciences |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Science inquiry** | | | | | |
| Questioning and predicting | Planning and conducting | Processing, modelling and analysing | Evaluating | Communicating | Collaborating and applying |

Pre-primary–Year 6

Strand: Science understanding

Sub-strand: Biological sciences

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Pre-primary | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| Plants and animals have basic needs that are met by the places they live | Plants and animals have external features that serve a purpose and by which they can be grouped | Plants and animals have life cycles through which they grow, change and have offspring | Living things can be distinguished from non-living and once-living things, and grouped by their characteristics | Producers, consumers and decomposers have roles within a habitat and interact in ways that can be represented by food chains | Living things have structural and behavioural adaptations that enable their survival in their habitat | The growth and survival of living things are affected by the changing conditions of their environment and the influence of human activities |

Sub-strand: Chemical sciences

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Pre-primary | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| Objects are made of various materials that have observable properties | Materials can be changed physically without changing their composition | Materials can be combined for a particular purpose | The observable properties of solids and liquids and how adding or removing heat leads to a change of state | Processed materials, including fibres, metals, glass and plastics, are made from raw materials, such as wool, ores, sand and oil, and have a range of physical properties that influence their use | The observable properties of solids, liquids and gases can be explained by the motion and arrangement of atoms and molecules (particles) | Materials can undergo reversible changes and irreversible changes |

Sub-strand: Earth and space sciences

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Pre-primary | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| Daily and seasonal changes in the environment affect our local community and the world around us | Water is a natural resource that comes from a range of sources and is used by people, plants and animals in different ways | Earth is a planet in the solar system that orbits a star (the Sun) | Soils, rocks and minerals are important Earth resources, and are used by humans and other living things in different and interconnected ways | Weathering, erosion, transportation and deposition cause slow or rapid change to Earth’s surface | The movement of Earth and other planets relative to the Sun and how Earth’s rotation on its axis and revolution around the Sun relate to cyclic observable phenomena, including the day/night cycle | The effect of sudden geological events on Earth’s surface, such as tsunamis, earthquakes and volcanic eruptions, and extreme weather, such as cyclones, extreme heat and floods |

Sub-strand: Physical sciences

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Pre-primary | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| The way objects move depends on factors, including their size, shape, material and the force applied | The strength and direction of a push or a pull force affects how an object moves or changes shape | Sound energy is produced by a range of natural and human-made sources and can be sensed | Energy can move from one thing to another (transfer), and change form (transform) | Forces are exerted by one object on another through direct contact, such as friction, or from a distance, such as magnetism and gravity | Light energy travels from a source in a straight path and can be absorbed, reflected, refracted, form shadows and be sensed | The transfer and transformation of energy in electrical circuits, including the role of circuit components, insulators and conductors |

Strand: Science inquiry

Sub-strand: Questioning and predicting

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Pre-primary | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| Pose questions and make predictions based on prior knowledge and shared experiences | Pose questions, explore ideas and make predictions based on knowledge and experiences | | Pose questions and make predictions based on planned observations of phenomena that include variables to be measured and changed | | Pose testable questions that include variables to be measured and changed, and apply science knowledge to make predictions | |

Sub-strand: Planning and conducting

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Pre-primary | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| Participate in guided and self-initiated investigations making observations and assessing risks | Engage in guided investigations to explore and answer questions, test predictions, and assess risks | | Plan and conduct investigations, including elements of fair tests, and consider the material and equipment risks | | Plan and conduct fair, safe and repeatable investigations | |
| No content | Make and record observations, including informal measurements | | Make and record observations, including formal measurements using familiar scaled instruments | | Use equipment to observe, measure and record data | |

Sub-strand: Processing, modelling and analysing

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Pre-primary | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| Represent and discuss observations and identify patterns | Sort and order data using provided tables and represent data using visual or physical models | | Organise and represent data using tables, column graphs and models to identify patterns | | Organise and represent data using tables, graphs and models to identify the relationships between measured and changed variables | |

Sub-strand: Evaluating

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Pre-primary | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| Discuss similarities and differences between predictions and observations | Compare observations to predictions and identify further questions for investigation | | Compare findings with those of others, and to predictions; consider if investigations were fair; and identify questions for further investigation | | Compare findings with those of others, and to predictions; evaluate the fairness of an investigation and suggest improvements; and pose questions for further investigation | |

Sub-strand: Communicating

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Pre-primary | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| Share questions, predictions, observations and ideas with others | Communicate observations, ideas, and findings using everyday and scientific vocabulary | | Communicate ideas using scientific vocabulary | | Communicate ideas in a variety of ways, including scientific reports with appropriate language features | |

Sub-strand: Collaborating and applying

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Pre-primary | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| Use the senses to learn about the natural and physical world and develop scientific ideas | Use science knowledge and understandings to make decisions and choices in their environment | | Use science knowledge to propose explanations for observed phenomena and solutions to problems | | Use science knowledge to develop considered responses to problems, at a local and global level, through investigation and research | |

Years 7–10

Strand: Science understanding

Sub-strand: Biological sciences

| Year 7 | Year 8 | Year 9 | Year 10 |
| --- | --- | --- | --- |
| Classification helps to order and organise the diversity of life on Earth into a hierarchy from kingdom to species; classification tools, including dichotomous keys, can be developed and used to classify organisms | Cells are the basic units of living things and can be viewed with a compound microscope; animal cells have specialised structures and functions, including the cell membrane, cytoplasm, nucleus and mitochondria; plant cells have specialised structures and functions, including the cell membrane, cytoplasm, nucleus, mitochondria, cell wall, chloroplasts and large vacuoles | Plants and animals have structural, behavioural and physiological adaptations that enable their survival in their environment | Cell division processes of meiosis and mitosis produce new cells with chromosome numbers specific to their role; chromosomes contain genes that are composed of DNA (deoxyribonucleic acid) |
| Food chains and food webs can be used to represent energy flow in ecosystems and predict possible impacts of human activity | Flowering plant and vertebrate systems carry out specialised functions that enable them to survive and reproduce, including systems for gas exchange, transportation of materials around the organism and reproduction | Organisms have mechanisms to respond to changes in their environment; endotherms and ectotherms respond differently to changes in external temperature; tropisms help plants respond to external stimuli | Patterns of monohybrid inheritance, including autosomal dominant/recessive and sex-linked recessive inheritance, can be predicted using pedigrees and Punnett square crosses |
| Population size and species diversity can be affected by abiotic and biotic factors; sampling techniques can be used to monitor abiotic factors and estimate numbers of organisms; ecological monitoring can be used to inform ecosystem health and impacts of human activity | The [theory](https://k10outline.scsa.wa.edu.au/home/teaching/curriculum-browser/science-v8/overview/glossary/theory) of evolution by natural selection explains the past and present diversity of living things, including variation within a species, adaptations and speciation |

Sub-strand: Chemical sciences

| Year 7 | Year 8 | Year 9 | Year 10 |
| --- | --- | --- | --- |
| Properties of the different states of matter can be explained by the motion and arrangement of particles; states can change with the addition or removal of energy | Matter is composed of atoms which contain protons, neutrons and electrons; matter can be classified as elements or compounds which can be compared using different representations, including symbols, formulae and models | The atomic number and mass number of an element can be used to determine the number of protons, neutrons and electrons in an atom of the element; isotopes of an element have the same number of protons but different numbers of neutrons in their nuclei and have the same chemical properties | The ability of atoms to form chemical bonds can be explained by the arrangement of electrons in the atom; ionic bonding involves electron transfer and covalent bonding involves sharing of electrons |
| Mixtures, including solutions, contain a combination of pure substances that can be separated using a range of techniques, including decantation, filtration, evaporation, crystallisation, chromatography and distillation | Elements of the periodic table can be classified as metals and non‑metals based on their physical properties | The structure and properties of atoms relate to the organisation of the elements in the periodic table; elements in the same group on the periodic table have similar properties | Reactions follow general patterns that help to predict the reaction products, including precipitation reactions and reactions of acids with bases, metals and carbonates; word and balanced chemical equations can be used to represent these reactions |
|  | Changes to substances can be classified as physical or chemical; chemical changes involve the formation of new substances | Compounds are formed when atoms lose, gain or share electrons; non‑metal elements combine to form covalent substances; positively charged ions and negatively charged ions combine to form ionic compounds; compounds can be represented using chemical formulae and models | The rate at which a reaction occurs can be altered by changing factors, including temperature, concentration and the surface area of a reactant |
|  |  | Chemical reactions involve rearranging atoms to form new substances; word and balanced chemical equations can be used to represent the rearrangement of atoms in a chemical reaction and demonstrate the law of conservation of mass |  |

Sub-strand: Earth and space sciences

| Year 7 | Year 8 | Year 9 | Year 10 |
| --- | --- | --- | --- |
| Celestial objects can be classified as planets, stars, moons, asteroids, meteors, comets, constellations and galaxies; planets in our solar system have distinguishing features, including composition, temperature, size, orbit, rotation, tilt of axis, moons and rings | The theory of plate tectonics explains global patterns of geological activity, including the formation of features at divergent, convergent and transform plate boundaries | Global systems, including the carbon and water cycles, rely on interactions involving the biosphere, lithosphere, hydrosphere and atmosphere | The formation of stars, galaxies and solar systems has continued since the time of the Big Bang; stars have a life cycle determined by their mass |
| Predictable phenomena on Earth caused by its position relative to the Sun and the Moon, including lunar phases, eclipses, seasons and tides | Rocks are composed of minerals; the key processes of the rock cycle are involved in the formation of igneous, sedimentary and metamorphic rocks; the properties of these rocks reflect their formation and influence their use | Changes to global systems can be used to explain patterns of global climate change | Space exploration contributes to knowledge of the formation and evolution of the universe and Earth, as well as providing useful tools and technologies to improve our life on Earth |
| Minerals can be classified using physical properties, including colour, streak, lustre, transparency, hardness and cleavage; useful resources can be extracted from minerals |

Sub-strand: Physical sciences

| Year 7 | Year 8 | Year 9 | Year 10 |
| --- | --- | --- | --- |
| Change to an object’s motion is caused by unbalanced forces, including friction, gravitational, magnetic and electrostatic forces; the unit of measurement for force is the newton | The different forms of energy can be classified as either kinetic or potential energy; energy transformations and transfers cause change within systems | Sound waves are longitudinal waves produced by vibrating objects; sound waves travel through solids, liquids and gases at different speeds; sound is reflected when coming into contact with a solid or liquid surface | Motion can be quantitatively determined; quantities, including time, distance, displacement, speed, velocity and acceleration can be classified as scalar or vector; vector diagrams can be used to represent the magnitude and direction of motion |
| Simple machines, including levers, inclined planes and wheels and axles, provide a mechanical advantage, including force, distance and speed advantage | Heat is transferred by conduction in solids, convection in liquids and gases, and radiation in all states; heat can be reflected and absorbed | Light is an electromagnetic wave; light is made up of photons that have both particle and wave properties; light can be reflected from plane and curved mirrors and refracted when passing through concave and convex lenses | Newton’s laws of motion can be used to predict motion; the relationship between force, mass and acceleration of objects can be quantitatively determined |
|  | The flow of electricity through a circuit is affected by the type of circuit; a load placed in a circuit transforms electrical energy into other forms of energy; safety switches and circuit breakers are devices installed in buildings to protect people and electrical systems |  | The law of conservation of energy can be applied to analyse system efficiency in terms of energy inputs and outputs, transfers and transformations |

Strand: Science inquiry

Sub-strand: Questioning and predicting

| Year 7 | Year 8 | Year 9 | Year 10 |
| --- | --- | --- | --- |
| Propose investigable questions and make predictions based on scientific knowledge to explore scientific models, identify patterns and test relationships | | Propose investigable questions and hypotheses to test relationships and develop explanatory models | |

Sub-strand: Planning and conducting

| Year 7 | Year 8 | Year 9 | Year 10 |
| --- | --- | --- | --- |
| Plan and conduct reproducible investigations to answer questions; recognising and managing risks and considering ethical issues | | Plan and conduct valid and reproducible investigations to answer questions and test hypotheses, developing and following risk assessments, and considering ethical issues | |
| Select and use equipment to generate and record data with precision, using digital tools as appropriate | | Select and use equipment to generate and record data with precision to obtain appropriate sample sizes and replicable data, using digital tools as appropriate | |

Sub-strand: Processing, modelling and analysing

| Year 7 | Year 8 | Year 9 | Year 10 |
| --- | --- | --- | --- |
| Construct appropriate representations, including tables, graphs, models and mathematical relationships, to organise and process data and information | | Select and construct appropriate representations, including tables, graphs, descriptive statistics, models and mathematical relationships, to organise and process data and information | |
| Analyse data and information to describe patterns and relationships, identify anomalies and draw conclusions based on evidence | | Analyse and connect a variety of data and information to identify and explain patterns, relationships and anomalies, and draw conclusions based on evidence | |

Sub-strand: Evaluating

| Year 7 | Year 8 | Year 9 | Year 10 |
| --- | --- | --- | --- |
| Reflect on scientific investigations, including evaluating the quality of the data collected, and identifying improvements | | Evaluate validity and reliability of methods and validity of conclusions, including identifying possible sources of error, and describe specific ways to improve the quality of the data | |
| Construct evidence-based arguments to support conclusions or evaluate claims | | Construct arguments based on analysis of a variety of evidence to support conclusions or evaluate claims | |

Sub-strand: Communicating

| Year 7 | Year 8 | Year 9 | Year 10 |
| --- | --- | --- | --- |
| Communicate ideas, findings and arguments for specific purposes and audiences, including selection of appropriate content, language and text features, using digital tools as appropriate | | Communicate scientific ideas and information for specific purposes and audiences, including constructing evidence-based arguments and selection of appropriate content, language and text features, using digital tools as appropriate | |

Sub-strand: Collaborating and applying

| Year 7 | Year 8 | Year 9 | Year 10 |
| --- | --- | --- | --- |
| Illustrate how the development of scientific knowledge has benefited from collaboration across disciplines and the contributions of people from a range of cultures | | Illustrate how advances in scientific understanding often rely on developments in technologies and engineering and technological and engineering advances are often linked to scientific discoveries | |
| Illustrate how science understanding and skills have influenced the development of individual, community and workplace practices | | Illustrate how proposed scientific responses to contemporary issues may impact on society | |