| SCIENCE |  |
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| By the end of **Year 3** | By the end of **Year 5** | By the end of **Year 7** | By the end of **Year 9** |
| Science as a human endeavour**Science is a part of everyday activities and experiences.**• Science has applications in daily life, including at home, at school, at work and in leisure time*e.g. medicines to treat illness in people and animals; electricity for lights.*• Science can impact on people and their environments*e.g. knowledge of the effects of the sun’s rays influences sun safety precautions.*• Stewardship of the environment involves conserving natural resources*e.g. strategies to conserve water and preserve wilderness environments.*• Australian Indigenous knowledge of natural phenomena has developed over time as a result of people observing, investigating and testing in everyday life*e.g. observing changes in the environment to help determine seasons.* | 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.* | 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.* | Science as a human endeavour**Responsible and informed decisions about real-world issues are influenced by the application of scientific knowledge.**• Immediate and long-term consequences of human activity can be predicted by considering past and present events*e.g. consequences of unsustainable use of fossil fuels can be seen in environmental impacts.*• Responsible, ethical and informed decisions about social priorities often require the application of scientific understanding*e.g. use of alternative forms of energy; use of recycled water; development of influenza and cervical cancer vaccines.*• People from different cultures contribute to and shape the development of science*e.g. Australian Indigenous knowledge can be applied to land and water management, food production and waste management.* |
| Earth and beyond**Changes in the observable environment influence life.**• Earth and space experience recurring patterns and natural cycles of events, including seasons, weather and moon phases, and these can affect living things*e.g. tides affect life on the shoreline; seasons affect the growth of plants; some animals hibernate in winter.*• Materials of the earth can be used in various ways*e.g. water for drinking; soil for growing crops.* | 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.* | 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.* | Earth and beyond**Events on earth and in space are explained using scientific theories and ideas, including the geological and environmental history of the earth and the universe.**• Scientific ideas and theories offer explanations about the earth that extend to the origins of the universe*e.g. ideas about the expanding universe.*• Global patterns of change on earth and in its atmosphere can be predicted and modelled*e.g. the effects of rising temperatures on natural environments.*• Geological evidence can be interpreted to provide information about past and present events*e.g. the earth’s surface is shaped by volcanoes and earthquakes, which can be understood in terms of the theory of plate tectonics.* |
| Energy and change**Energy can be used for different purposes.**• Pushes and pulls affect the shape and motion of objects*e.g. squeezing clay; stretching a spring; throwing a ball.*• Forms of energy, including electricity, light, heat, movement and sound, have different applications*e.g. electricity can light the classroom; most animals use light to see; the sun can warm us; kicking a ball makes it move; blowing musical instruments makes sound.* | 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.* | 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.* | Energy and change**Forces and energy are identified and analysed to help understand and develop technologies, and to make predictions about events in the world.**• An unbalanced force acting on a body results in a change in motion*e.g. a car is slowed by friction from braking.*• Objects remain stationary or in constant motion under the influence of balanced forces*e.g. a book resting on a table; a vehicle travelling at constant speed.*• Energy can be transferred from one medium to another*e.g. the stove transfers heat to the pot of water.*• Transfer of energy can vary according to the medium in which it travels*e.g. some materials are good conductors of heat; light is refracted when it moves from air to water — the pencil appears to bend in a glass of water.*• Energy is conserved when it is transferred or transformed*e.g. a light bulb converts electrical energy into light energy and also produces heat.* |
| Life and living**Needs, features and functions of living things are related and change over time.**• Animals, plants and non-living things have different features/characteristics*e.g. some animals have fur; unlike plants and animals, rocks do not grow.*• Offspring have similar characteristics to their parents*e.g. dogs have puppies; cats have kittens; birds have chicks.*• Change occurs during the life cycle of living things*e.g. a seed grows into a plant; a joey in the pouch develops into an adult kangaroo.*• Living things depend on the environment and each other*e.g. plants need light to make food; adult birds feed their young*. | 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.* | 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.* | Life and living**Organisms interact with their environment in order to survive and reproduce.**• The diversity of plants and animals can be explained using the theory of evolution through natural selection*e.g. Australian marsupials would have had a common pouched ancestor.*• In ecosystems, organisms interact with each other and their surroundings*e.g. the scavenger role of the crab in the mangroves means that it has a plentiful supply of food and it contributes by cleaning its surroundings.*• Complex organisms depend on interacting body systems to meet their needs internally and with respect to their environment*e.g. the digestive system processes food and the circulatory system distributes it throughout the body.*• All the information required for life is a result of genetic information being passed from parent to offspring*e.g. hereditary information is contained in the genes located on chromosomes.*• Changes in ecosystems have causes and consequences that may be predicted*e.g. bushfires destroy natural bushland, which temporarily changes the ecosystem; birds return to dried-up waterholes after rain.*  |
| Natural and processed materials**Materials have different properties and undergo different changes.**• Materials are categorised according to their observable properties*e.g. texture, colour and solubility can be used to group materials.*• Properties of familiar materials may be changed*e.g. water is usually liquid but is solid when frozen.* | 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.* | 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.* | Natural and processed materials**The properties of materials are determined by their structure and their interaction with other materials.**• Changes in physical properties of substances can be explained using the particle model*e.g. use of the particle model to describe states of matter.*• Matter can be classified according to its structure*e.g. elements and compounds, or molecules and atoms.*• Chemical reactions can be described using word and balanced equations*e.g. hydrogen plus oxygen gives water or 2H2 + O2 = 2H2O.*• Reaction rate is affected by various factors, including temperature, concentration and surface area*e.g. milk goes sour more quickly when left at room temperature; a soluble tablet will dissolve faster when it is crushed.* |